XFOIL Operating Instructions

1. A (free) version of XFOIL can be downloaded for windows or MAC at:
   http://web.mit.edu/drela/Public/web/xfoil/

2. A video tutorial for using XFOIL can be found at the following website:
   https://dl.dropboxusercontent.com/u/26744502/XFOIL.mov

3. Double click on the XFOIL executable

4. When it loads, you will see a list of options. To repeat this list of options at any point type "**?**"

5. We will start by loading a NACA 0012 airfoil. Type "NACA"
   a. When it asks for the NACA 4 or 5 digit airfoil designation, type "0012"

6. Type "PPAR" to show a plot of the airfoil
   a. Don't close the plot window when you are done
   b. Simply hit the <enter> key in the command window to continue.

7. At this point we wish to run the airfoil flow simulation. Type "OPER" to enter the operating section of the computer code.

8. You will want to do a viscous simulation. Type "VISC" at this point. You will need to calculate and enter a Reynolds Number. We will talk about this in class. (Re = rho * U * chord / viscosity)

9. Now, you want to run the analysis. To do this, we will prescribe the angle of attack by typing:
   i. "ALFA"
   ii. You can enter the angle in degrees, try 5
   iii. You should get CL, CD and the pressure coefficient distribution around the airfoil.
   iv. If the airfoil says "Not Converged" retype the alfa command and re-enter the angle of attack. If it fails to converge after three attempts, then move on to the next angle.

10. You can change the angle of attack by simply typing "ALFA" again and entering a different value.

11. Once you have evaluated all of the angles for the NACA 0012 airfoil, you can do this all again for the NACA 4412.

12. To load the FX 63-139 airfoil, you will need to download the *.dat file from the UIUC online database.

Happy wing designing!