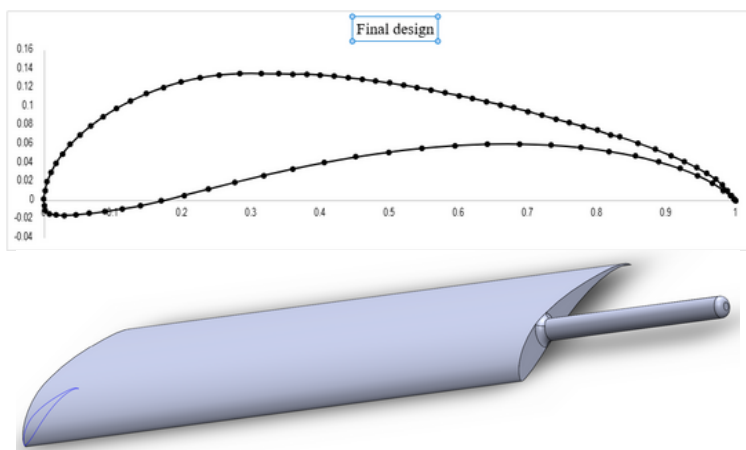
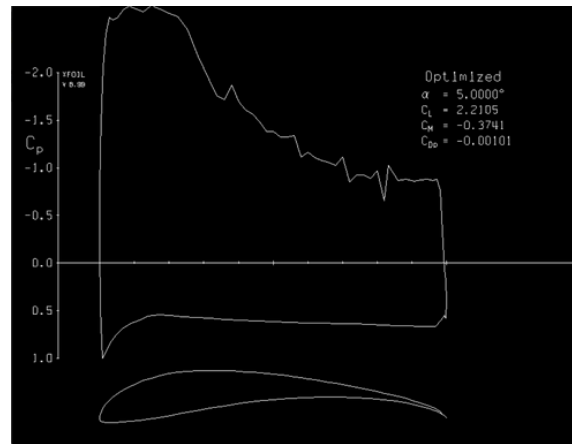


AIRFOIL DESIGN COMPETITION - FAIRFIELD UNIVERSITY



Excel and SolidWorks image of airfoil



XFOIL plot of lift and drag coefficients

What?

- Design and print a custom airfoil based on a CLARK-Y airfoil design.
- Maximize Lift in 5m/s flow and 5 degree AoA. Additional credit for best stall angle.
- Use Airfoiltools.com and XFOIL software for blueprint and analysis

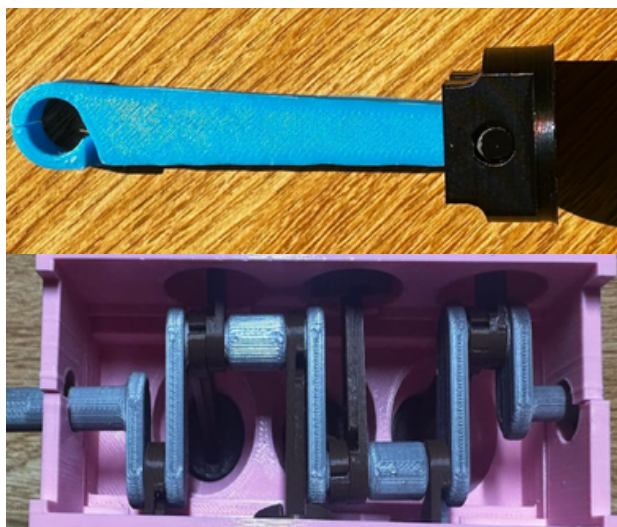
How?

- Used Airfoil tools to get base design and graphs, Exported plot into **Excel** and **XFOIL** to analyze lift and drag.
- Translated Selig file to **SolidWorks**.
- Test in Armfield C-15 wind tunnel.

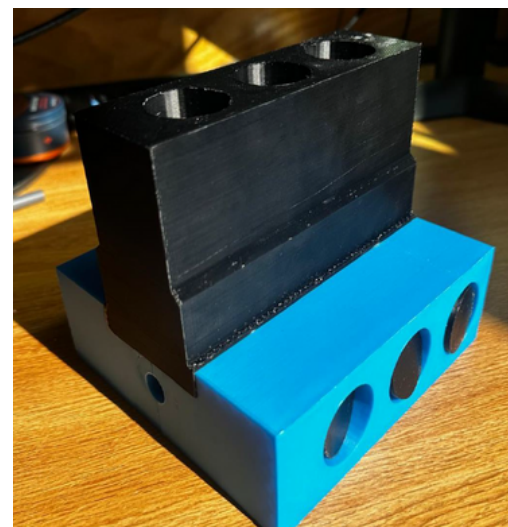
Results

- Achieved an experimental lift coefficient of 1.71 and stall angle of 13 degrees.
- Placed **2nd** overall in competition.

3D PRINTED INTERNAL COMBUSTION ENGINE - FAIRFIELD UNIVERSITY



Clamp style piston rod and crankshaft



Engine block final assembly

What?

- Design and print a model engine capable of withstanding the highest rpm.
- Design must stay within theoretical power and dimensional constraints.
- Theoretical horsepower and torque specs of a Coyote V8 engine.

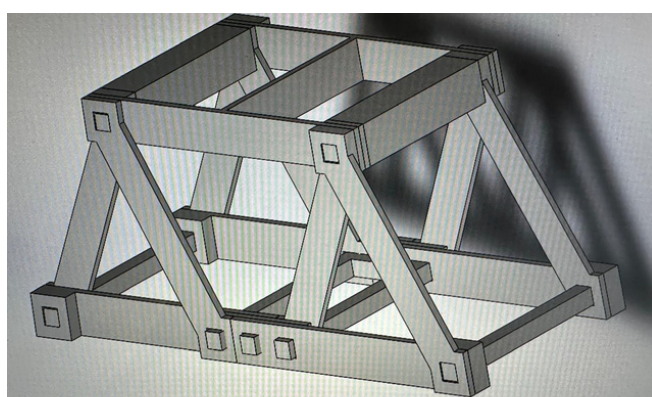
How?

- Used **SolidWorks** to design engine applying **DFM** and **DFI** principles to allow for easy assembly and high performance.
- Applied **GD&T** on all designs to ensure proper fitment.
- Printed using Ender 3 Pro.

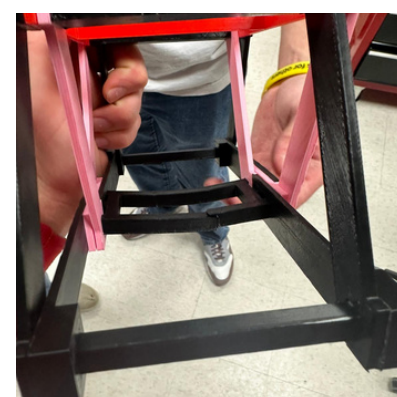
Results

- Successfully achieved **1710 rpm**, failing at piston rod due to poor print quality.
- Placed **2nd** in competition,
- SolidWorks files are corrupted.

3D PRINTED TRUSS BRIDGE- FAIRFIELD UNIVERSITY



SolidWorks design iteration 4



Iteration 4 failure

What?

- Design and print a truss bridge using calculations from engineering statics.
- Design must stay within weight and dimensional constraints.

How?

- Used **SolidWorks** to design bridge pieces accounting for **DFM** practices for 3D-printers.
- Performed **GD&T** and theoretical load calculations on all parts.
- printed using an Ender 3 Pro

Results

- Successfully withstood **273 lbs** load.
- Placed **1st** in gradewide competition.
- SolidWorks files are corrupted.