## Relevant Reading

- Flight Vehicle Design Book
  - Chapter 2: Fundamentals (13 pages)
  - Chapter 6.3: Propellers (4 pages)

## Problem 1 Vocabulary

Explain the following terms; making sure to use sufficient detail, including any math or helpful figures. In some cases, these terms are simple one sentence definitions, in others, you should include several paragraphs to explain them fully.

### Airfoil Geometry Terms

- Chord
- Thickness
- Camber
- Leading Edge
- Leading Edge Radius
- Trailing Edge
- Trailing Edge Wedge Angle

### Forces and Moments

- Lift
- Drag
  - Induced Drag
  - Parasitic Drag
    - Skin Friction Drag
    - Pressure Drag
  - Compressibility Drag
- Pitching Moment
- Lift and Drag Polars
  - Angle of Attack
  - Zero Lift angle of attack
  - Lift Curve Slope
  - Stall

## Problem 2 Exploration

Complete the following exploration.

### 2.a Prerequisites

i. Install Xfoil.jl and complete the Example Usage Guide.

### 2.b Forces, Moments, and Polars

i. Create the following plots using the example airfoil from the previous problem:
   - Lift vs Angle of Attack
   - Induced Drag (near and far field) vs Angle of Attack
   - Moment vs Angle of Attack
   - Lift vs Drag
   - Lift/Drag vs Angle of Attack

ii. Identify the lift curve slope in your lift vs angle of attack plot, and compare it to the lift curve slope from thin airfoil theory ($2\pi$).