Background
Cargo Plane is a senior design project competing in the International SAE Aero Design competition. We are designing an RC aircraft that will carry payloads of soccer balls and metal plates. Our goal is to build an aircraft that generates high lift at low speeds while carrying a large payload within a small cargo bay.

Requirements/Constraints
- **Maximum Loaded Weight**: 55 lbs
- **Maximum Wingspan**: 10 ft
- **Maximum Power**: 1000 Watts
- **Takeoff Runway**: 100 ft
- **Landing Runway**: 400 ft
- **Cargo**: Soccer Balls and Steel Plates
- **CG Requirement**: Flyable in empty and loaded configuration

Future Work
The UCI Cargo Plane Team will continue the computer aided design and optimization of the aircraft’s aerodynamic and structural performance. Manufacturing is the next phase which will start Winter Quarter of 2022. After manufacturing is completed, the team will conduct testing on the Cargo Plane.

Wing Specifications
- **Airfoil**: Eppler 423
- **Chord (ft)**: 2
- **Span (ft)**: 10
- **Aspect Ratio**: 5
- **Flaperon Span (ft)**: 10
- **Flaperon Chord (ft)**: 0.5

Tail Specifications
- **Airfoil**: NACA 0012
- **Wingtip Type**: Hoerner
- **Horizontal Span (ft)**: 4.8
- **Horizontal Chord (ft)**: 1.0
- **Vertical Span (ft)**: 2.18
- **Vertical Chord (ft)**: 1.1
- **Vertical Moment Arm (ft)**: 5.0
- **Elevator Span (ft)**: 4.8
- **Elevator Chord (ft)**: 0.25
- **Rudder Span (ft)**: 2.18
- **Rudder Chord (ft)**: 0.33

Competition Scoring
\[
FS = \frac{120*(3*S+W_{\text{Payload}})}{b+L_{\text{Cargo}}}
\]