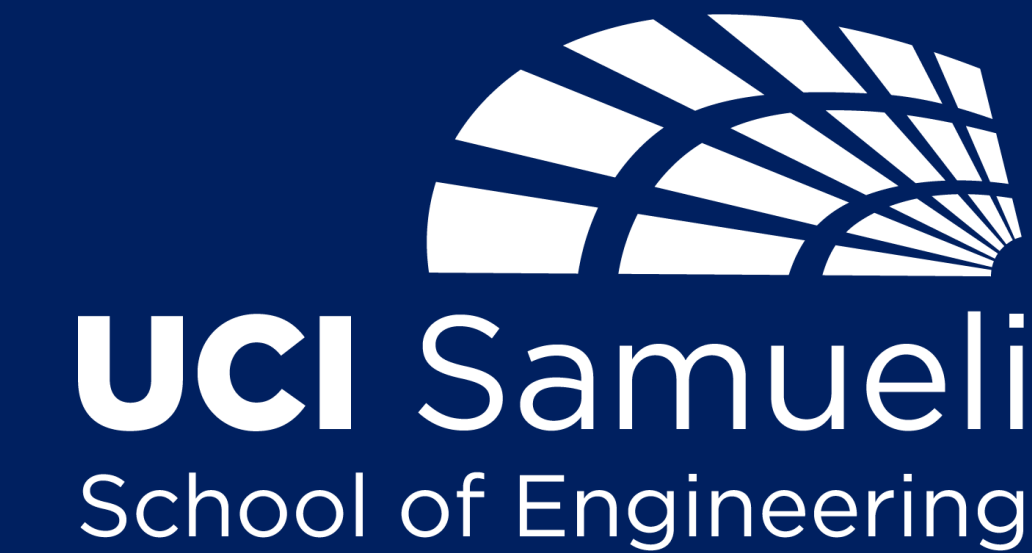




UCI Cargo Plane AE-20



Background

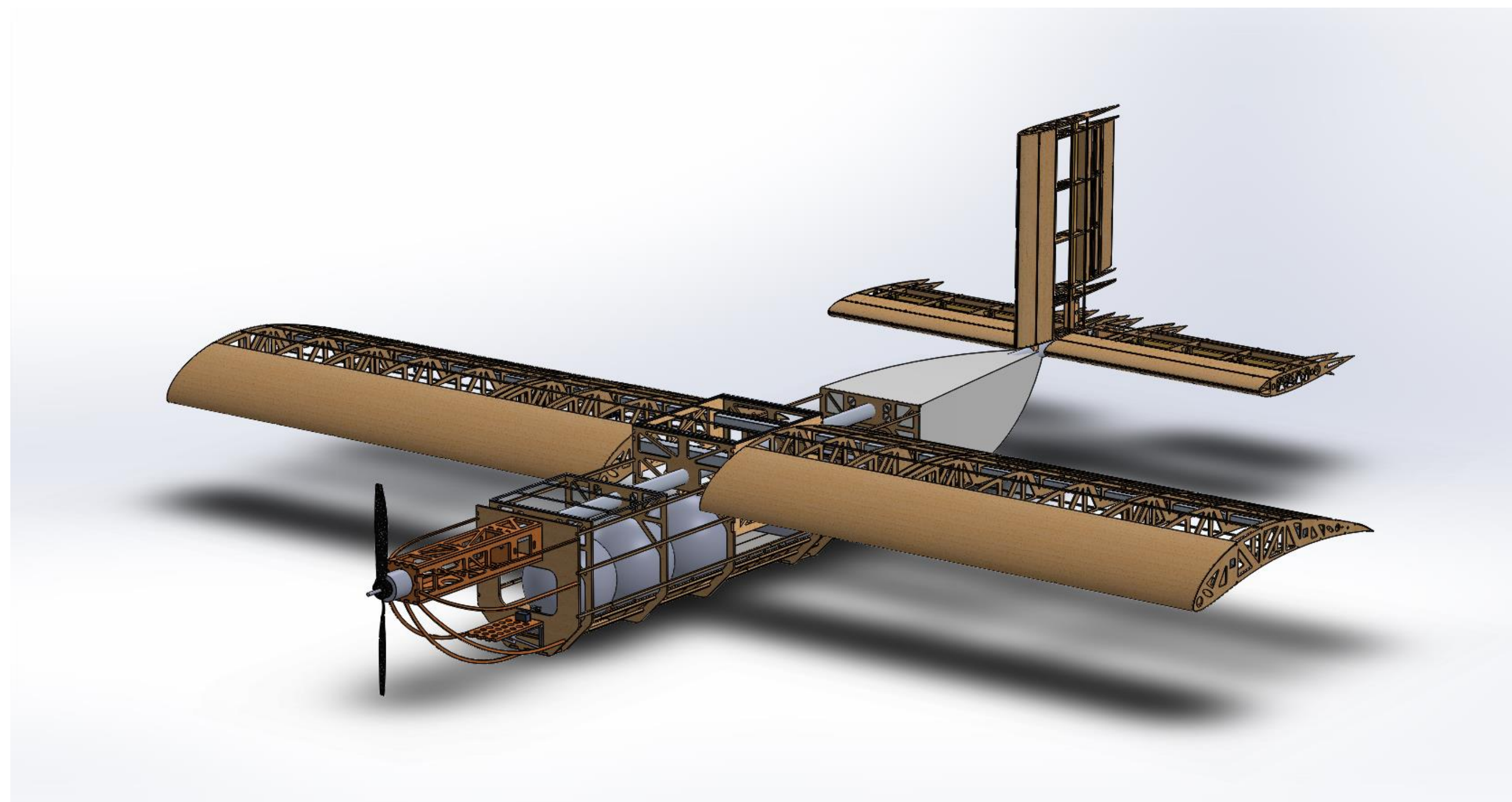
UCI Cargo Plane participates in the Society of Automotive Engineers (SAE) Aero Design West Competition. This competition provides engineering students exposure to real-life engineering challenges in the aerospace industry.

Goal

Our goal is to win the SAE Aero Design West Competition. In order to achieve this goal, we must create a bush plane design that can operate from short runways while carrying oversized cargo.

Requirements

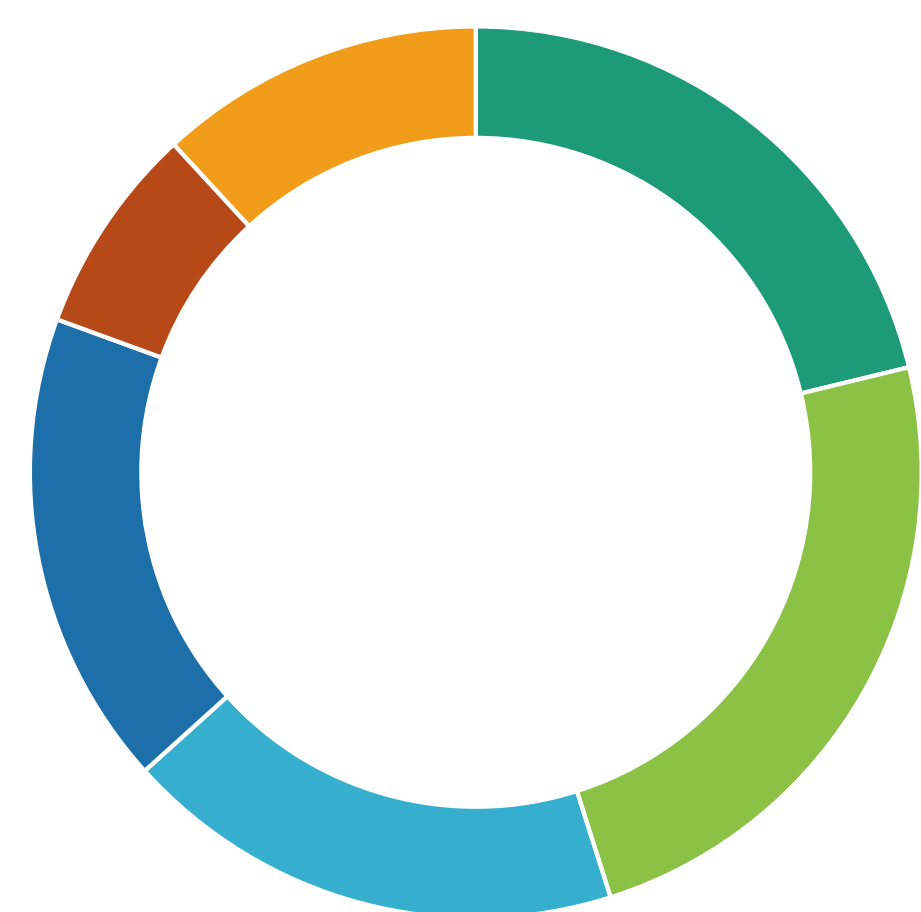
- Maximum Loaded Weight: 55 lbs.
- Maximum Wingspan: 10 ft.
- Maximum Power: 1000W
- Takeoff Runway: 100 ft.
- Cargo: Size 5 Soccer Balls & Steel Plates
- CG Requirement: Flyable in empty and loaded configuration



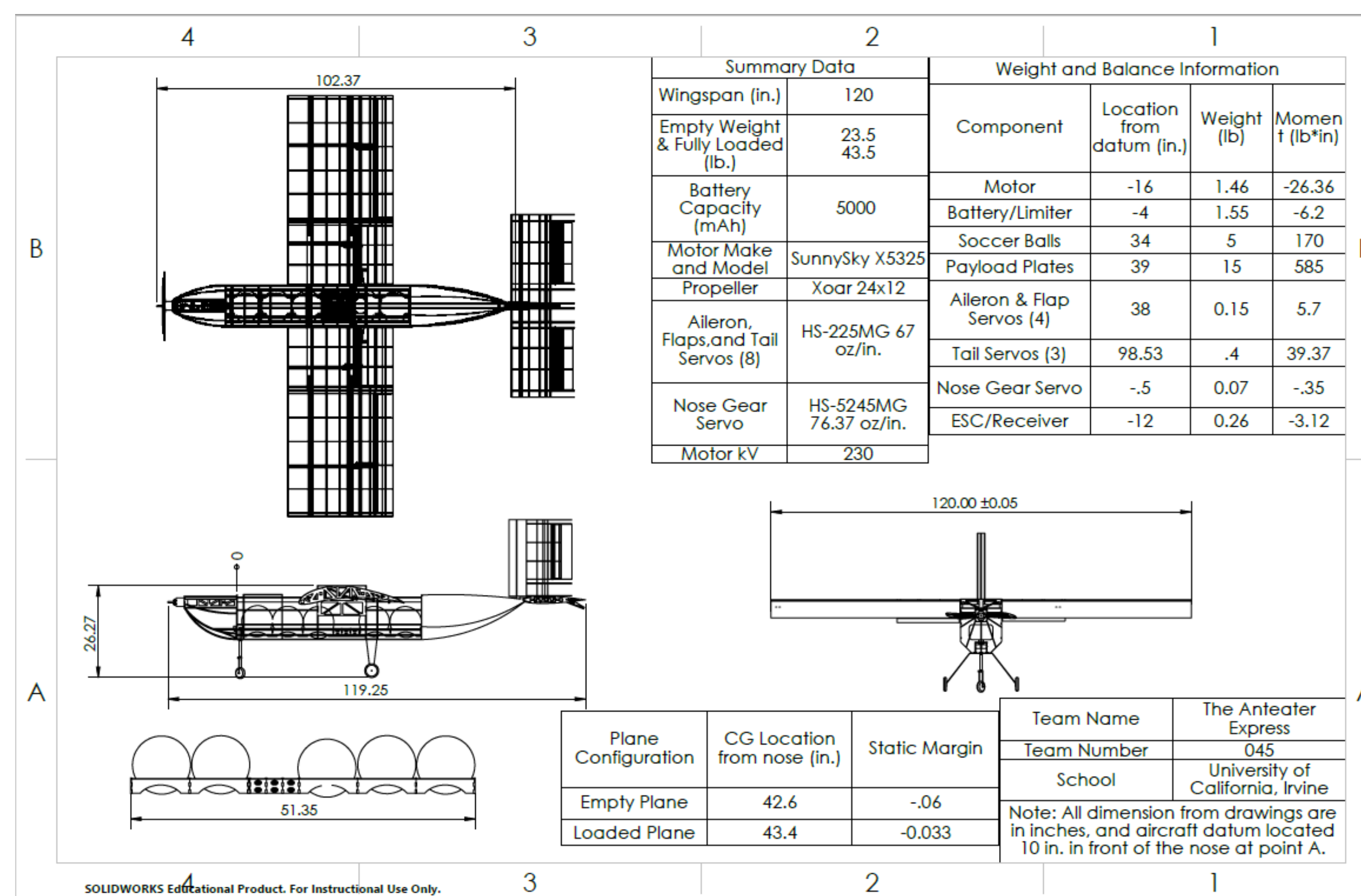
Specifications

Wing	
Airfoil	Epppler 423
Chord (ft)	2.5
Span (ft)	10
Planform Area (ft ²)	25
Aspect Ratio	4
Aileron Span (ft)	2.825
Aileron Chord (ft)	0.375
Flap Span (ft)	1.4
Flap Chord (ft)	0.792
Fuselage	
Length (in)	102.37
Width (in)	11.85
Height (in) Without Landing Gear	15
Predicted Soccer Ball	5
Predicted Total Payload (lbs.)	20
Tail	
Airfoil	NACA 0012
Horizontal Tail Volume Coefficient	.60
Horizontal Tail Span (ft.)	4.41
Horizontal Tail Chord (ft.)	1.50
Horizontal Tail Planform Area (ft ²)	6.62
Horizontal Tail Aspect Ratio	17
Horizontal Tail Moment Arm (ft.)	5.67
Vertical Tail Volume Coefficient	0.06
Vertical Tail Span (ft.)	1.82
Vertical Tail Chord (ft.)	1.5
Vertical Tail Planform Area (ft ²)	2.73
Horizontal Tail Aspect Ratio	14.6
Vertical Tail Moment Arm (ft.)	5.40
Elevator Span (in.)	17.69
Elevator Chord (in.)	6.3
Elevator Planform Area (in ²)	111.43
Elevator Aspect Ratio	2.81
Rudder Span (in.)	15.625
Rudder Chord (in.)	6.3
Rudder Planform Area (in ²)	98.44
Rudder Aspect Ratio	2.48
Landing Gear	
Material	Carbon Fiber Composite (Rear) 6063 Aluminum and PLA (Nose)
Height (in.)	9.5
Motor	
Thrust (lb.)	12
RPM/V (KV Rating)	230
Model	SunnySky X5325
Propeller	Xoar 24x12
ESC	100A Castle ESC

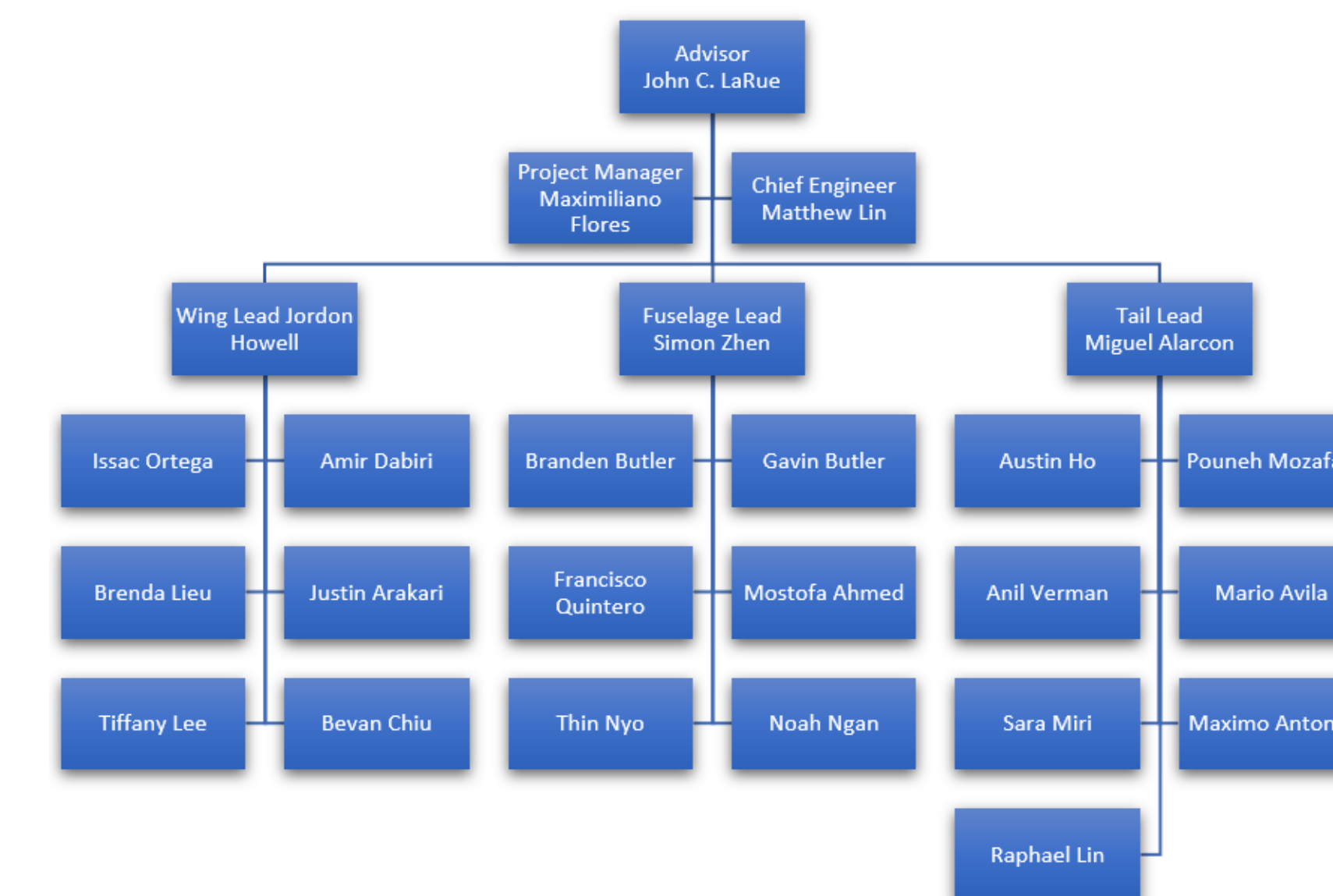
Cargo Plane 2019-2020 Budget



- Competition (\$1,200)
- Wing (\$1,030)
- Tail (\$429)
- Controls (\$1,350)
- Fuselage (\$976)
- Tools (\$670)



Team Structure



Contact Information

Advisor | John C. LaRue | jclarue@uci.edu
Project Manager | Maximiliano Flores | maximisf@uci.edu

Research and Design
(November 8th)

SolidWorks Design
(November 22nd)

Manufacturing
(December 6th)

Testing
(January 31st)

Redesign
(February 14th)

SAE - Technical Report Due
(February 20th)

Assembly Complete
(March 6th)

Flight Test
(March 13th)

SAE Competition
(April 3rd - 5th)