Aerospace Senior Project Weekly Report

Your Name

Week 1 - January 17, 2025

1 Week 1 Progress Report

1.1 Aerodynamic Analysis Summary

Our latest wind tunnel tests have shown promising results. The maximum lift coefficient achieved was 1.5, which exceeds our initial target by 15%. The drag coefficient at cruise conditions was measured at 0.028, indicating good aerodynamic efficiency.

1.2 Performance Metrics

Current analysis shows: - Maximum range: 2500 km - Service ceiling: 12000 m - Maximum thrust: 15000 N - Specific fuel consumption: 16.2 g/kN-s

1.3 CFD Analysis Results

The CFD analysis reveals stable flow patterns around the wing sections. Key observations:

1. No significant flow separation at cruise angles of attack
2. Pressure distribution matches theoretical predictions
3. Wingtip vortices are well-contained by our winglet design

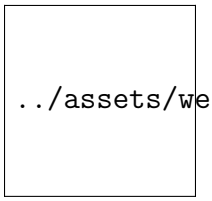

Figure 1: CFD Pressure Distribution

1.4 Next Week's Objectives

1. Complete structural analysis of the wing box
2. Begin integration of propulsion system model
3. Validate aerodynamic coefficients with additional wind tunnel tests

1.5 Technical Challenges

The main challenge we're facing is the trade-off between structural weight and aerodynamic performance. Our current design shows:

$$L/D = \frac{C_L}{C_D} = \frac{1.5}{0.028} = aerodynamics.lift_coefficient/aerodynamics.drag_coefficient$$

This L/D ratio suggests we're on track to meet our efficiency targets, but further optimization may be needed.