March 14, 2024

MAE 159
Aircraft Design

FINAL REPORT

The purpose of this report is to present the results of an airplane design study to evaluate and compare the effect of **advanced technology** on **capability** and economic performance (**DOC** and **fuel burn per seat-mile**). The report is expected to be of industrial quality, and it will be evaluated accordingly. Format is as follows:

I. Approach (35%)
Size two airplanes for the same design specification, distinct by existing versus advanced technology. **Sizing results** (including primary design curves, e.g. W_{TO} vs AR & Λ), **Specifications** and **Payload-Range** plots. Discussion of the comparison of the existing and advanced technology airplanes. Present and justify the final configurations and their features.

II. Configuration Drawings (45%)
The primary drawings will be 3-views of both airplanes, including all significant dimensions and a Table of Characteristics. In addition, fuselage interior layout and cross-section drawings are required.

III. Economic Performance (20%)
Comparison of the fuel burn per seat mile and direct operating cost (DOC) for both airplanes. Thoughts on which advanced technology provided the greatest improvement.

APPENDIX

Provides a description of the calculations used to proceed from the sizing study results to the final configurations shown in the 3-view drawings, and must include wing layout, fuselage interior layout, fuel volume, center-of-gravity, landing gear, and tail volume calculations.

The **Final Report** and **Appendix** are due at **11:59 pm on March 14**.
Late reports will not be accepted.