

Full-Year Aircraft Design

AAE 490 / 590

SEMESTER I: CONCEPTUAL DESIGN



"Aircraft design is a separate discipline of aeronautical engineering—different from the analytical disciplines such as aerodynamics, structures, controls, and propulsion."

— DANIEL RAYMER, AIRCRAFT DESIGN

Course Overview



Undergraduate Option (AAE 490)

Complete your conceptual design in the Fall and transition seamlessly into AAE 451 in the Spring for Preliminary and Detail Design.



Graduate Component (AAE 590)

Integrate **Model-Based Systems Engineering (MBSE)** and digital engineering principles directly into your design cycle.



AIAA DESIGN COMPETITION

Teams base designs on official AIAA RFPs and compete at the national level.

DETAILS



STRUCTURE

Lectures + Weekly Labs



PREREQUISITES

AAE 334, 340, 352, 364, 400, 339/490APF/337



INSTRUCTOR

Dr. Thiago Guimaraes

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16-WEEK CONCEPTUAL DESIGN ROADMAP

WEEKS 1-2

Intro to Design, RFP, Regs & Mission Analysis

WEEKS 3-4

First Weight Sizing, Layout & Wing Geometry

WEEKS 5-6

Drag Build-Up, Polars & Propulsion Selection

WEEKS 7-8

Constraint Analysis, Design Point & Range Perf.

WEEKS 9-10

Maneuver Perf, Sensitivity & Static Stability

WEEKS 11-12

Control Sizing, Mass Properties & Cost/Trades

WEEKS 13-14

Presentation Skills, Report Workshop & Dry Runs

WEEKS 15-16

PDR Presentations