MAE 155B
Engineering Design II (4 units)

Class/Laboratory Schedule: four hours of lecture, two hours of lab, six hours outside activity, 12 hours/week total

Course Coordinator(s): Mark Anderson and John Hwang

Textbooks/Materials:

1. Nicolai, L.M. and Carichner, G.E., Fundamentals of Aircraft and Airship Design, Vol. 1 - Aircraft Design, American Institute of Aeronautics and Astronautics, Reston VA, 2010.

2. Meyer, R.X., Elements of Space Technology for Aerospace Engineers, Academic Press, 1999.

Catalog Description: The principles of aerospace vehicle design including the conceptual, preliminary, and detailed design phases. Aeronautical or astronautical design project that integrates all appropriate engineering disciplines as well as issues associated with optimization, teamwork, manufacturability, reporting, and professionalism. Program or materials fees may apply.

Prerequisites: MAE 113, MAE 142, MAE 155A, and MAE 170, or consent of instructor.

Course Type: Required

Course Objectives:

Objective 1: Teach students how to solve complex, open-ended design problems and to integrate knowledge of fundamental aeronautical and astronautical topics in the design of an aerospace system.

Objective 2: Strengthen and apply knowledge of aerospace topics including aerodynamics, aerospace materials, structures, propulsion, flight mechanics, and stability and control.

Objective 3: Develop students' abilities to effectively work in teams, manage project priorities, and meet project deadlines.

Objective 4: Enhance student skills in graphical, written, and oral communication.

Objective 5: Provide students with the experience of applying engineering science theory to hands-on design problems.

Course Topics:

1. Project Management: Scheduling, Risk Reduction Strategies
2. Design Problem Identification and Mission Performance Requirements
3. Concept Generation and Creativity
4. Preliminary and Detail Design Techniques, System Development Process
5. Engineering Sciences Applied to Aerospace Systems Design and Analysis
6. Computer-Aided-Design and Computer-Aided-Analysis
7. Prototype Construction and Flight Testing

Last Updated: May 2025