

MECH&AE 157D/E Capstone Descriptions

Prof. Lopez (Lecture 1 – Winter & Spring 2026)

In this section of the aerospace engineering capstone course, you will learn the fundamental principles of autonomous aerospace systems. Students will work in teams of five or six to build a custom aerial vehicle, along with the software necessary to make it autonomous. The scope of the project and the autonomy required to complete it will be specified in the first quarter of the capstone. Lectures and labs will primarily take place in the first quarter to bridge the knowledge gaps between the capstone requirements and the material covered in the AE curriculum. Lecture topics include flight dynamics and control, trajectory planning, autonomous decision-making, electronics and mechatronics, sensing and estimation, aerodynamics, propulsion, strength of materials, and engineering standards. Lecture topics are integrated into structured labs to reinforce the material through hands-on experience and are expected to be extensively used in the design part of the capstone.

Prof. Spearrin (Lecture 2 – Winter & Spring 2026)

In this section of the aerospace engineering capstone course, you will learn the fundamental principles of rocket engineering. Students will work in teams of five or six to develop a custom rocket vehicle, utilizing engineering software for design and supporting analysis. The scope of the project will be specified in the first quarter of the capstone. Lectures and labs will primarily take place in the first quarter to bridge the knowledge gaps between the capstone requirements and the material covered in the AE curriculum. Lecture topics include flight dynamics, stability, trajectory, aerodynamics, combustion, propulsion, mechanics of materials, manufacturing, and engineering standards. Lecture topics are integrated into structured labs to reinforce the material through hands-on experience and are expected to be extensively used in the design part of the capstone.