

AE6383-A/Q Applied Design Lab

Fall 2025 Syllabus

Course Instructors

Prof. Dimitri Mavris

dimitri.mavris@aerospace.gatech.edu

Office Hours: By appointment

Office: Weber 301

Dr. Evan D. Harrison

evan.harrison@asdl.gatech.edu

Office Hours: TBD

Office: Weber 321C

Teaching Assistants

Balaji Ravikanti, Youssef Lamrini

bravikanti3@gatech.edu, ylamrini3@gatech.edu

Office Hours: TBD

Office: Weber 116

Introduction

Welcome to Applied Design Lab for the Fall 2025 academic term. The course is listed as Applied Design Lab (ADL) for 1 credit hour in the course catalog of the Georgia Institute of Technology. This course is the lab portion of AE6343 – Aircraft Design I course. Students are encouraged to take AE6383 and AE6343 concurrently. Please read the following information carefully¹.

Class Website

The official ADL class website is on Canvas at <https://canvas.gatech.edu/>. This website is intended to provide all official lecture material, handouts, presentations, notices and relevant information. Note that the website will be constantly updated and must be checked on a regular basis. All announcements are automatically emailed to your GT student account. It is the student's responsibility to maintain access to this account and address email filtering issues. To log in use your GT account username (usually your first name initial followed by your last name and a number, e.g., *gburdell3*) and your GT account user password. Once on Canvas, select the AE6383 course. Distance Learning students can access lecture videos through this website. On campus students will not have access to lecture videos until the end of the semester. Any exceptions shall be discussed on a case by case basis with the TAs.

In-Person Lectures

The lab meets on Thursday, 12:30 pm to 3:15 pm in the Manufacturing Related Disciplines Complex (MRDC) building room 2404. Please check for announcements in Canvas or emails to the class distribution list indicating details or changes to the meeting place. Students who are on the main Georgia Tech campus are expected to attend in person. Students in sections Q and Q3 are welcome to join the live lectures using the link on the class website. The class recordings should be made available for students of Q and Q3 sections on the class website shortly after the end of the class.

Throughout the semester, students will coordinate with project teams to prepare and deliver reviews of their Vehicle Grand Challenge Projects. These presentations may take place in alternate on-campus locations which better accommodate the presentation reviews. Updates on the timing and locations of these review presentations will be provided through the course website.

¹Aerospace Systems Design Laboratory (ASDL) graduate track students must sign up for the AE6344-MAV in following Spring semester, which awards you credit hours for the second semester of your research project. If you are not planning on enrolling in AE6344 in the Spring semester, please let the instructor and the teaching assistants know as soon as possible.

Calendar

The official school calendar of Georgia Tech is provided by the Office of the Registrar and is available at <http://www.registrar.gatech.edu/home/calendar.php>.

Class Objective

The main objective of the ADL is to expose students to real world problems through team design projects. The focus is on the application of design methods, approaches, concepts and tools in a group setting using material presented and other academic material background as a knowledge basis. Projects include design competitions and current real world problems. This class will focus on system-level conceptual design.

Vehicle Grand Challenge Projects

Groups for Vehicle Grand Challenges (VGC) will be determined early in the class and these groups will work together through both Fall and Spring semesters. This will be a hands-on experience on design methodologies and tools with supporting lectures. Progress on these projects will be assessed by progress reports and in-class presentations by the team to the instructor and assistants. Dates for deliverables and presentations will be provided through the course website.

During the semester, each Vehicle Grand Challenges will be progress through three “sprints” which culminate in reviews. These reviews will allow for teams to provide an update of their progress to the course instructors and technical advisors. In addition to general updates on progress, teams are expected to provide information on key aspects of their problem as described for each sprint.

Review 1: Heilmeier Sprint

Results of literature review for your Vehicle Grand Challenge; describe the overall scoping for your problem, addressing the key considerations of the Heilmeier Questions.

Review 2: Formulation Sprint

Problem Formulation for your Vehicle Grand Challenge, which includes initial plans for the technical approach for your problem.

Review 3: Prototype Sprint

Prototype of project capability e.g. core component of analysis, initial draft of vehicle design, etc.

Grade Breakdown

Grades are based on participation, deliverables, updates, and presentations. The distribution of these elements are shown below in Table 1.

Table 1: Grade Breakdown

Class Logistics	Class Survey Participation	5%	August 23
	Professional Biography	5%	September 20
	Presentation Participation	5%	—
	In-Class Attendance	10%	—
Heilmeier Sprint	Presentation	5%	September 23-27
	Report	5%	September 20
	Feedback	2%	September 20
	Individual Contribution	3%	—
Formulation Sprint	Presentation	10%	October 21-25
	Report	10%	October 18
	Feedback	2%	October 18
	Individual Contribution	3%	—
Prototype Sprint	Presentation	15%	November 18-22
	Report	15%	November 15
	Feedback	2%	November 15
	Individual Contribution	3%	November 15

The following scale relating numeric to letter grades will be used for the entire course:

- $90\% \leq A \leq 100\%$
- $80\% \leq B < 90\%$
- $70\% \leq C < 80\%$
- $60\% \leq D < 70\%$
- $0\% \leq F < 60\%$

Student Expectations

Participation

Students are expected to attend and participate in lectures. This will include attending and engaging in presentations of other design teams while providing constructive feedback. In

additional to in-class reviews for students, assistants, and instructor, the design teams will present at a kick-off meeting and a final review for a competition, client, or other entity. All design teams will present during the External Advisory Board (EAB) in May.

Lectures

Throughout the semester, lectures will be provided on supplementary subjects which provide additional insight to topics and material covered within AE6343. Often these lectures will be provided by subject-matter experts who are invited by the course instructors. Students are expected to participate in the course discussions and to ask questions whenever in doubt about class material. Lectures are performed in a discussion type atmosphere where consistent questioning of concepts takes place and student engagement is crucial.

Usage of AI Tools

Students are not allowed to create text or code using generative machine learning models and services in any of their graded assignments. While automatic text generation could be used to get students out of writer's block, all text turned in for grading must be students' own work (*i.e.*, model-generated text must never be copied into documents to be turned in for grading). Similarly, students are free to use such tools to get started with their coding assignments or discover issues with their work. However, none of the auto-generated code is allowed in the assignments that are turned in for grading. Furthermore, tools such as ChatGPT are not respectable sources and, if students use such tools during their research, statements must be backed up by real, referenceable, published work. If students have questions about the use of such tools, they must contact the instructors for clarifications and receive permissions for the use if they think it is legitimate. Any detection of unauthorized auto-generated text or code will be subject to penalties in accordance with institute policies established by the Office of Student Integrity. Finally, students are reminded that they are attending school to learn new skills and methods and they should focus on attaining them rather than looking for shortcuts that are easily noticeable and reflect badly on their work ethic.

Publication Policy

Students are strongly discouraged from publishing directly from Grand Challenge work and should instead pursue spin-off publications in the form of 8900 series or thesis work.

Course Content and Schedule

The following Table 2 is a tentative list of the topics covered in this course and schedule. As this course coordinates lectures from a variety of subject-matter experts, topics and schedules are subject to change throughout the semester. If necessary, updates to the course schedule will be provided through the course website.

Table 2: Tentative Course Schedule

Week	Topic
1	Introduction to VGCs
2	Heilmeier Questions; Technical Writing and Presentation
3	NPSS Engine Modeling
4	FLOPS & EDS
5	Multi-disciplinary Analysis and Optimization (OpenMDAO)
6	Review 1: Heilmeier Sprint
7	Space Design Tool
8	Digital Engineering
9	Project Management
10	Review 2: Formulation Sprint
11	Version Control [Git/Github]
12	High Performance Computing
13	Grand Challenge Panel
14	Review 3: Prototype Sprint
15	Thanksgiving Holiday (no lecture)
16	Reading Period (no lecture)

Please note that, due to calendar constraints, VGC reviews may have to occur outside of regular class times. The teaching staff will elaborate on this matter further along the course.

Georgia Tech School of Aerospace Engineering Values



1. **Honesty:** The School of Aerospace Engineering values honesty and integrity of all members of our community. An important element of this value is the academic honor code.

Georgia Tech Honor Challenge Statement: I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community.

Honor Code: [Article I: Honor Agreement](#)

2. **Well Being:** The School of Aerospace Engineering values the complete well-being of all members of its community, which includes professional, physical, spiritual, emotional, and social dimensions. There are numerous resources to support the health and well-being of all members of our community: [Mental Health Resources](#)

Mental Health Resources:

- Emergencies: Can either Call 911 or call Campus Police at 404.894.2500 <http://www.police.gatech.edu/>
- Center for Assessment, Referral, and Ed. (CARE): 404.894.3498 (Counselor On-Call) <https://care.gatech.edu/>
- Counseling Center: 404.894.2575 <https://counseling.gatech.edu/>
- Stamps Health Services: 404.894.1420 <https://health.gatech.edu/>
- Student Life and Dean of Students: 404.894.6367 <https://studentlife.gatech.edu/content/get-help-now>

- Victim-Survivor Support (VOICE): 404-385-4464/(or 4451) <https://healthinitiatives.gatech.edu/well-being/voice>
- National Suicide Prevention Lifeline: 988 or 1.800.273.TALK (8255)
- Georgia Crisis and Access Line: 1.800.715.4225

COVID-19 Safety

GT Safety Guidelines: <https://health.gatech.edu/tech-moving-forward>

Current guidance is summarized at the site above and please continue to follow the site above and other Institute communications in case changes occur

3. **Social Justice:** The School of Aerospace Engineering values social justice for all members of the Georgia Tech community and the larger society. Social justice means that everyone's human rights are respected and protected. We stand committed in the fight against racism, discrimination, racial bias, and racial injustice. Our shared vision is one of social justice, opportunity, community, and equity. We believe that the diversity and contributions from all of our members are essential and make us who we are. We believe that our impact must reach beyond the classroom, research labs, our campus, and the technology we create, but must also improve the human condition where injustice lives. We will continue to work to understand, value, and celebrate all people and create an inclusive educational and work environment that welcomes all.

As a matter of policy, Georgia Tech is committed to equal opportunity, a culture of inclusion, and an environment free from discrimination and harassment in its educational programs and employment. Georgia Tech prohibits discrimination, including discriminatory harassment, on the basis of race, ethnicity, ancestry, color, religion, sex (including pregnancy), sexual orientation, gender identity, national origin, age, disability, genetics, or veteran status in its programs, activities, employment, and admissions. For more information, you can visit [this website](#).