AE 483 Syllabus
Fall 2023

Personnel

- Wayne Chang (Instructor) [wlchang@illinois.edu]
- Dan Block (Lab Manager) [d-block@illinois.edu]
- Nagesh Eranki (Teaching Assistant) [neranki2@illinois.edu]
- Onalli Gunasekara (Teaching Assistant) [onallig2@illinois.edu]
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Course Website

All course content will be disseminated through the course website on Canvas, so make sure to gain access and bookmark it.

Time and Place

Lecture

- Mondays and Wednesdays from 1:00pm-1:50pm
- 116 Roger Adams Laboratory

Laboratory

- Date and time is by section:
  - AB1 (Mondays from 9:00am-10:50am, with Tiger)
  - AB2 (Mondays from 3:00pm-4:50pm, with Onalli)
  - AB3 (Wednesdays from 9:00am-10:50am, with Tiger)
  - AB4 (Wednesdays from 3:00pm-4:50pm, with Tiger)
  - AB5 (Fridays from 9:00am-10:50am, with Nagesh)
  - AB6 (Fridays from 3:00pm-4:50pm, with Nagesh)
  - AB7 (Tuesdays from 10:00am-11:50am, with Onalli)
  - AB8 (Mondays from 5:00pm-6:50pm, with Onalli)
- 302 Transportation Building

Course Description

This course provides a project-based introduction to autonomous aerospace systems, specifically un-piloted and remotely-piloted aerial vehicles. As a case study, you will learn how to automate a state-of-the-art, high-performance, commercially-available quadrotor helicopter. The lecture will focus on algorithm design (e.g., vehicle kinematics and dynamics, optimal control, state estimation, and collision avoidance). The laboratory will focus on algorithm implementation and flight testing.

Prerequisites

Be an undergraduate student in Aerospace Engineering, with credit or concurrent registration in AE 202, AE 352, AE 353, AE 370, and PHYS 212.

Required Texts

None

Final Grade

Grading categories:

Quizzes - 10%
Laboratory - 50%
Project - 40%

Your final grade will be assigned as follows:

- $\geq 97\% = A+$
- $93\% \leq x < 97\% = A$
- $90\% \leq x < 93\% = A-$
- $87\% \leq x < 90\% = B+$
- etc.

No curve will be applied to your final grade.

Homework and Quizzes

Homework will be assigned to help you prepare for weekly quizzes. Homework will not be graded.

Laboratory

You will work in groups of two for nine weeks on structured laboratory assignments. Every week, you will be asked to complete a number of tasks in person during your lab section and show the results to your TA. Some weeks, you may also be asked to do something before and/or after your lab section. Both group members will receive the same grade on all laboratory assignments. Labs will begin the week of August 21 (the first week of class). There will be no labs during the week of September 4 (Labor Day).

Project

You will work in groups of four on a final project after you are done with the labs. Project assignments will include completing a number of milestones, compiling a video highlight, and submitting a written report. All four group members will receive the same grade on all project assignments.

Time Management

You will earn two credit hours for completing this course. The federal definition of a "credit hour" is an amount of work that reasonably approximates not less than two hours of instruction and four hours of out-of-class student work each week throughout the semester. Therefore, each of you should expect to spend about six hours on this course each week, including the time you spend in lecture and in your lab section. If you are struggling with time management, please **ask one of us for help**.

Absences and Late Work

We expect you to attend all lectures and all labs. We also expect you to submit all assignments on time.

We also want you to stay home when you are ill — to not participate in lecture, lab, or in-person group work under these circumstances. Similarly, we want you to take advantage of opportunities to interview for jobs and to participate in the sorts of events (academic conferences and competitions, intercollegiate athletics, etc.) that enrich your experience at university.

Therefore, we will assume that you are acting in good faith and that absences and late work will be rare. We will handle them on a case-by-case basis. Please **ask one of us for help** when this situation arises.

Academic Integrity

You are encouraged to talk with all of your colleagues about all of your work this semester, so long as you **acknowledge and cite** the people with whom you talked. Materials submitted must be your own — please refer to the student code for a definition of plagiarism, which is an academic integrity infraction. Academic integrity allegations like plagiarism will be reported using the Faculty Academic Integrity Reporting (FAIR) system. Confirmed infractions may result in a zero grade for the corresponding assignment and, in some cases, a failing grade for the course. If you are unsure of what constitutes plagiarism or any other breach of academic integrity, please **ask one of us for help**.

Belonging

[source]

A feeling of belonging and inclusion is critical to the success and health of our community. The Aerospace Engineering department has a committee called Aero's Space to Belong. They offer office hours, one-on-one discussion, and a reporting process. If you experience conflict that undermines your or someone else's feelings of belonging, please consider using these resources: https://aerospace.illinois.edu/diversity/reporting.

Anti-Racism and Inclusivity

[source]

The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) (https://bart.illinois.edu/). Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

Disability-Related Accommodations

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To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to https://www.disability.illinois.edu. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available that can help diagnosis a previously undiagnosed disability. You may access these by visiting the DRES website and selecting "Request an Academic Screening" at the bottom of the page.

Family Educational Rights and Privacy Act (FERPA)

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Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See https://registrar.illinois.edu/academic-records/ferpa/ for more information on FERPA.

Religious Observances

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Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus at the beginning of the semester for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should notify your instructor of the conflict and follow the procedure at https://odos.illinois.edu/community-of-care/resources/students/religious-observances/ to request appropriate accommodations. This should be done in the first two weeks of classes.

Sexual Misconduct Reporting Obligation

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The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

Emergency Response

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Emergency response recommendations can be found at the following website: http://police.illinois.edu/emergency-preparedness/. I encourage you to review this website and the campus building floor plans website within the first 10 days of class: http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/.