

COURSE ANNOUNCEMENT

Fall 2022

AAE590: Estimation and Control Laboratory

Instructor: Dr. Ran Dai, ARMS 3227, 496-5243

Course Description:

The primary goal of the course is to provide students with hands-on experience to practice fundamental knowledge in core areas of autonomy, including estimation, control, and optimization. Topics will be approached in individual areas and integration of them in specifically designed unmanned missions. This course will also provide an introduction to common mathematical and software tools required in the experimental design and performance evaluation of autonomous systems.

Course Objectives:

Upon completion of this course, students will be able to:

1. Design and implement estimation schemes to estimate the motion of a mobile object.
2. Develop and implement classical control laws for motion control of a mobile robotic system.
3. Develop and implement optimal control laws to optimize a designated performance index for a mobile robotic system.
4. Design and Implement numerical optimization algorithms for path planning of a mobile robot.
5. Design and Implement cooperative control schemes for multiagent robotic systems in cooperative missions.
6. Construct, program, and test the operation of a robotic system to perform a specified task.

Prerequisite:

Undergraduate level control, estimation, and optimization courses.

Level:

This course is intended for graduate and senior undergraduate students.

Lab Assignments:

There will be 6 lab assignments and one final throughout the semester.