VIP 4603 Syllabus

Experimental Flights – VVM – 3 Credits

Fall 2026

Instructor Information

Instructor: Michael Mayo

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General Course Information

Description

Like many VIP classes, this class is project and research based. Students will work as teams to design, build and fly drones for various missions :

- Drone Delivery – Design and implementation of a delivery network for small packages throughout Georgia Tech campus as well as the design of drones that can assist with search and rescue and aid delivery after disasters such as hurricanes that makes roads unusable.
- Forest Fire Fighting – Developing drones that can detect forest fires using cameras and computer vision and map out location and growth of fire. Also researching use of drones as comm relays.
- Inventory Management – Developing warehouse management software for use with indoor drones that can scan barcodes to automate inventory management. Drones must be able to avoid collisions with obstacles inside a warehouse environment.
- Military Applications – Building drones that can be launched from tubes and perform maneuvers related to loitering munitions

Current tasks include conceptual design of new drones, selection of COTS hardware to build drones, CAD and 3D printing to build custom parts, drone assembly and flight testing, operation and modification of autopilot software, development of client-side and back-end software to facilitate missions, algorithms to optimize flight routes, documentation of hardware and software, and outreach to potential partners.

Students will be sorted into teams based on their interests and skills – during the first week every student will be tasked with filling out a form which ranks their interest in each team.

Course Learning Outcomes

Upon successful completion of this course, you will have gained skills in some of the following areas:

- Drone Design
- Drone Construction
- Drone Flight Testing
- Software Development for Drones
- Team Management

Required Course Materials

No material needed as a prerequisite for the course other than access to a PC. All drone materials will be provided or purchased through the class budget.

Grading Policy:

Grades will be determined based on the following components:

Project Contributions (1/3 of grade)

- Make contributions that advance the project
    - Brainstorming and documentation of ideas
    - Project planning – schedule, task assignments, milestones
    - Procurement of COTS hardware (find hardware and send orders to instructor)
    - Design of custom parts
    - Hardware Assembly
    - Whiteboarding, writing and testing code
    - Integration of new software
    - Flight Testing (planning, set up, support, piloting)
    - Troubleshooting hardware/software problems
    - Project Leadership
        - Organizing meetings
        - Onboarding new students
        - Communication with instructor
- Evaluated through peer review feedback, notebook documentation, and project results (shown in midterm and final presentations as well as flight tests or other demonstrations)

Documentation (Notebook) (1/3 of grade)

- Class notes
- Team meeting notes
- Description of task assignments, to-do lists, obstacles and contributions to project
- Links to github or other repo, screenshots of code or simulations, solidworks files, pictures of assembled hardware etc.
- This is the most important way to document what you have contributed to the project as an individual – make sure to include enough detail to give instructor a clear idea of what you have done
- Evaluated by instructor review of digital notebook hosted on OneDrive

Class Participation (1/3 of grade)

- Class Attendance
- Team Meeting Attendance
- Complete peer reviews, interest form etc.
- Communication in class and on MS teams etc.
- Evaluated by attendance forms, peer review feedback, and communication made online and offline

Description of Graded Components

There are no exams – the major grading milestones will be midterm and final deliverables which include:

- Presentations – a midterm and final presentation using powerpoint format will be presented by each student team. The presentations will summarize the major accomplishments of the team (design, construction and flight testing of drones and development of necessary software).
- Notebook Checks – a digital notebook will be created by each student and hosted on the class OneDrive. The notebook will contain all of the elements described in the Documentation component of the Grading Policy above. The notebook will be evaluated as a midterm and final deliverable.
- Peer Reviews – Students will evaluate teammates they have worked closely with at midterm and final intervals using the system hosted on the GT VIP website. Students will be evaluated for completion of their own peer reviews and based on the feedback given to them by other students in their peer reviews.

- Attendance – Students will be evaluated for their overall attendance in class and in outside-of-class team meetings. Attendance will be evaluated holistically with regards to excused absences and other extenuating circumstances.

The instructor will provide feedback on student performance including all of the above elements at the midterm mark about halfway through the semester. Midterm feedback is mostly a way for students to re-calibrate themselves and improve their performance in the class if needed. Final deliverables will have a much higher weight on a student's grade. The overall weighting is 20% midterm deliverables and 80% final deliverables with regards to a student's grade.

Course Policies

Attendance and/or Participation

Class attendance is required in order to facilitate team communication and interaction as well as communication with the instructor and learning through lectures and workshops.

Exceptions are given if a student has taken the class in a prior semester and has a verified schedule conflict preventing them from attending class in-person at the scheduled time, and has received permission from the instructor to not attend class due to the schedule conflict. In these cases the student will be expected to make extra project contributions and make extra effort to communicate with their team.

All students are expected to stay in communication with their team and attend outside of class team meetings.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism of another student's work will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Feel free to e-mail me to discuss your learning needs as well.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.