Final Project and Rocket Competition
AE 1350A: Introduction to Aerospace Engineering
Fall Semester 2008

Form a team of 3-4 people from your section of AE1350

Design, analyze, build, and fly a rocket that:
- Uses a single type C motor or smaller
- Carries a 15gram, (78.7mm x 13.9mm x 16.3mm) instrumentation payload without damaging the payload and providing it with suitable static ports (payload supplied by instructor on launch day)
- Is made of paper, wood, or breakable plastic, and contains no substantial metal parts
- Is deemed airworthy by instructor

The rocket should be designed to meet the following mission requirements:
- An apogee altitude of 300 feet
- A total time of flight of 20 seconds (launch to touchdown)
- A vertical speed of 12 feet per second at touchdown

Competition winners (across all 3 sections of AE1350) will be chosen based on a single launch on the launch day:
- Winner for coming closest to required apogee altitude
- Winner for coming closest to required total flight time
- Winner for coming closest to required touchdown vertical speed

Note:
- A single rocket/team could win all three prizes
- Rocket is disqualified if it does not land intact or lands outside designated landing area
- Teams will be allowed to repeat a failed attempt only at the discretion of the instructor
- Instructor can disqualify any rocket/team for safety issues or bad sportsmanship

Project grade will be based largely on the team's report. This report should clearly describe the team's pre-flight predictions of aerodynamic drag, stability, propulsion, and trajectory performance. There will be a small penalty if the rocket fails on launch day and the necessary instrumentation data was not obtained.

The project report:
1. Limited to 15 pages
2. Typed, using the AIAA conference paper format
3. Design rationale
4. Drag analysis
5. Propulsion system analysis
6. Weights and sizing analysis
7. Trajectory analysis
8. Picture of the constructed rocket
9. Source code for simulation, predicting motion of rocket in a vertical plane (altitude/down-range)
10. Simulation results for standard conditions on the Georgia Tech campus, and with a 5 m/s horizontal wind (use a vertical launch for purposes of generating plots):
    a. Predicted flight profile (altitude vs. time and altitude vs. horizontal position)
    b. Predicted vertical velocity as a function of time (vertical velocity vs. time)
11. Plots from data recorded on instrumentation payload
    a. Measured flight profile (altitude vs. time)
12. Comparison between pre-flight predictions and actual flight performance
13. Lessons learned from flight test, and state design changes that would achieve closer to specified performance based on information obtained from the flight test
14. Statement describing how the work and cost was divided between team members

Dates:
- Launch day, November 24th at the Burger Bowl , time to be determined
- Report due from team beginning of class December 3 (section A)

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