Lessons Learned in AAE 251 Spring 2018

Team Work

- Find a regular common time to meet early in the semester and stick to it. It will get harder as the semester progresses. Determine your priorities.
- Delegating work to members based on their areas of interest and capability
- Be vocal about what you can and cannot do when you accept work. Ideas can be harder to bring to fruition than initially assumed.
- Make sure everyone in the group understands the concepts from the class. For a lot of people this is new information. Don't leave someone behind just because they do not understand it. Find a way to get them in the know.
- Meeting in person was much more effective than "meeting up" on Google Docs
- Hold team members accountable for the work they are assigned. Late work delays the entire team.
- Communicate any changes to the entire group even if everyone is not involved in that part of the project. That way everyone has a general idea of everything that's going on.
- Divide the work but come together at the end to get input from everyone
- Learn how to disagree constructively.

Project Management

- Set deadlines and clear weekly and long term objectives to avoid wasting time.
- Find a way to meet deadlines like the weekly updates. Communicate about whose job it is to submit your update. Set a google reminder that goes out to everyone.
- Spend time working on background research. It becomes crucial knowledge for later work
- Set weekly goals.
- Start early and work continuously even if the work done is minimal. It keeps the workload at the back end to a minimum.
- The initial requirements and needs are just as important as the back end of the project. The aircraft design always starts with a list of stakeholders, needs, and requirements. These critical elements determine the function, cost, basic configurations, and other essential aspects of the aircraft. All the technical works, sketches and calculations are based on the list of needs and requirements.

- Spend time early sizing the aircraft before moving on to development as running code is "virtually cost free"
- Ranking the requirements was the most useful task to tackle at the beginning of the project and made the remainder of the project significantly easier.
- Decision matrices are a must because they eliminate any subjective decision making and you know that if your initial requirements and needs were thoroughly developed, you have the best concept at the end.
- Evaluate concepts concurrently and not one by one.
- Be clear and concise with your report to the customers.
- Take advantage of the feedback early on to better structure reports.

IT issues (Google Drive, Matlab etc.)

- Use a scheduling tool like google calendar to find common times to meet early in the semester.
- Google Docs is not good for equations.
- The appeal of working remotely is tempting but can have consequences in the long run. In person meetings were the most effective. This was stressed by multiple teams!
- Comment Code thoroughly including code from homeworks because it will come back to help you with the project.
- Be thorough with your background search. Finding the data you're looking for may be a matter of changing the phrasing of your search query.
- Verify that the numbers found online are valid with multiple sources. Incorrect numbers in will lead to incorrect results.
- Matlab is a powerful tool. Use it to your advantage and ask for help if you want to code something but don't know how. Chances are it will be easier than doing something by hand.
- Develop an effective file sharing structure early on so that version control with Matlab scripts and CAD models does not lead to lost work and unnecessary complications.
    - I personally recommend Dropbox. Everyone can download it for free and it integrates with the file management system of your computer seamlessly. Dropbox updates, and syncs most consistently as compared with OneDrive and Google Drive. But since google drive is the program used in this course for everything else, it may be worth trying to get it to integrate with the desktop of everyone on the team. From experience, having multiple group members

downloading and reuploading files to a web-based drive whenever they need to do work will almost certainly lead to version control issues at some point. CS oriented websites like Github are also an option. Alternatively, there may be a way to create a small server on Purdue's network to better integrate with ECN and ITAP computers.

General

- Make good use of feedback that you get from people in industry. Or with real world experience.
- Even with 6 people and 4 months, the completed work will just scrape the surface of such a complex problem. Let that be encouraging for your future work at school and in industry rather than overwhelming and discouraging in the midst of the project.