Project Team Charter

ME476C: Capstone I

Signature Cover Page

Print Name: **Signature:**

I agree to do an equal amount of work in the team. I understand that my grade will reflect my effort in the team.

Jelani Peay Jelani Peay

Print Name: **Signature:**

Aidan O'Brien

I agree to do an equal amount of work in the team. I understand that my grade will reflect my effort in the team

Print Name: **Signature:**

Salar Geolshan

I agree to do an equal amount of work in the team. I understand that my grade will reflect my effort in the team.

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xRyan Navarette Ryan Navarette

Print Name: Keerthi S. Gopi-Nagaruri **Signature:**

I agree to do an equal amount of work in the team. I understand that my grade will reflect my effort in the team.

1. Team Purpose:

The purpose of our team is to successfully utilize our diverse skillsets to not only excel in our senior project but to aid NASA by designing a low mass lunar habitat. This will be accomplished with great enthusiasm because every member of this team has a strong passion for the aerospace/aeronautics industry. Fortunately, this will allow us to work seamlessly together to complete the many tasks ahead of us. The team wants to gain technical and professional experience as well as make the transition from undergraduate students to professional engineers much smoother.

Our stakeholders for the duration of this project will be Dr. Oman and NASA. It is expected of us to present ourselves as well as our work in the most professional and efficient manner as possible. This includes but not limited to testing, manufacturing, and designing according to the current mechanical engineering standards. It is also expected of us to work out any issues we may have as a team in a calm and respectful manner to not delay progress.

2. Team Goals:

The goal of the project is to design a durable low mass lunar habitat. The habitat must be able to support 2 crew members for 30 days at the lunar south pole and must be less than a dry mass of 6,000kg. The team needs to design this habitat for use in the year 2028 and will create a design that will come in under a budget of $1 billion per year. The team will put a considerable amount of effort into ensuring that the design is backed up by a strong engineering analysis. To accomplish this, the team will research available current technology, apply fundamental engineering formulas, and consider a multitude of concepts.

Team members are willing to perform to the best of their ability and will consider what is best for team performance and morale. This includes setting aside time during the week, and on the weekend to meet or work on the project. The group is aiming for an A in the course, and will accomplish this by organizing the team's efforts, and facilitating a positive team environment. This will improve the team's quality of work and ensure that every member on the team can play to their strengths. The team will utilize all resources given to them by the client, and Dr. Willy, and will ensure that the quality of work is up to industry standards.

3. Team Member Personalities/Roles/Responsibilities:

Keerthi S. Gopi-Nagaruri (ENTJ-A) - Project Leader

Keerthi has long worked in teams and has the most experience running a team. His MBTI personality classification is an ENTJ. ENTJ's are leaders and they strive to achieve goals by any means necessary. The disadvantage of an ENTJ's include rude, bossy and impatient. These disadvantages are inversely correlated with greater the experience.

- Experienced in various projects such as HPVC, Angry Bird Design, Wind Turbine Design and Gore Engineering Design.
- Oversaw team to deliver product and fulfil client requirements in each project.
- Possess extensive knowledge in building functional models, QFD, CAD, DFMA and FMEA analyses.
- Elementary understanding of Fluid mechanics, CNC mill and laith machining, MATLAB, FEA and CAD advanced modeling.
- Knowledgeable in prototyping and testing.

Position Responsibilities:

- Establish open communication with the team and client to understand the product requirements.
- Work with the team to deliver smooth operations n order to design, build and deliver according to the client requirements.
- Work with team to identify and implement improvements in processes and products.
- Establish open communication and create a learning environment for all team members.
- Manages tasks, develops overall schedule, runs meetings, reviews individual contributions, provides safe and welcoming team environment, does NOT make all decisions (rather facilitates discussion of the team to arrive at team decisions)

Aidan O'Brien (INFJ-A) - Logistics and Co-Testing Engineer

Aidan is a highly intuitive individual. Like Jelani, Aiden is also an INFJ. As such, Aiden is able to balance work and life very well. Aiden can identify critical problems develop possible solutions and suggest improvements. Aiden also has an uncanny insight into people and situations along with a voracious appetite for researching motorcycles.

- Has experience with SOLIDWORKS to aid with cad modeling.
- Has experience with ANSYS mechanical and Workbench. Comfortable with running FEA simulations.
- Confident with LATEX which is an excellent option for formatting technical reports.
- Familiar with MATLAB, and willing to assist with any coding.
- Has experience with AUTOCAD.

Position Responsibilities:

- Logistics Engineer: Manages internal and external communication (point of contact for client), documents meeting minutes, manages facility and resource usage

- Test Engineer: Oversees experimental design and testing, plans testing procedures, acquires necessary equipment for testing, runs all tests for team

Jelani Peay (INFJ-A) - Financial Manager

Jelani is a brilliant individual. INFJ's are idealists and have an inborn sense of morality. However ideal their plans are they are able to rationalize the steps to realize their goals to make lasting impact. Jelani is also very apt at managing time and completing tasks as they come up. Being part of a small team of five members will Jelani's strong point as he is the most successful working individually and in small teams (both of which are crucial in this process).

- Has experience with programming languages such as C, MATLAB, and Python
- Familiar with SOLIDWORKS and can assist with any CAD modeling.
- Experience with materials analysis (e.g., tensile tests and conductivity tests)
- Communications
- Teamwork
- Networking

Position Responsibilities:

- Provide financial reports and interpret final information to team members.
- Keep track of and update bill of materials and handle purchase orders.
- Bring up issues with the budget and identify improvements to the purchase orders and shipments.
- Conduct reviews and evaluations for cost-reductions to the product adhering to client requirements.
- Oversees all purchases, main contact with Front office for budget management, monitors and records all purchases for budget tracking, updates Bill of Materials

Ryan Navarette (ENFJ-T) - CAD Engineer

Ryan is an extroverted individual with an uncanny ability to replicate a given design and develop a CAD package meeting the requirements of the provided design. Ryan also has worked at an internship at Raytheon familiarizing himself with PTC Creo Parametrics. Being an ENFJ, Ryan is very apt at noticing team dynamics and takes a great deal of pride achieving and inspiring others.

- Has experience with CAD modeling software such as SOLIDWORKS and PTC CREO PARAMETRICS
- Hands on experience with manufacturing processes, including but not limited to FEA, welding, casting, Non-Destructive Testing, Mechanical (Destructive) Testing, and Metallograph
- Experience with meeting management requirements and completing assigned tasks under specific time constrains
- Familiar with MATLAB, C#, and C++
- Hands on experience with the ASME T14.5-2009 GD&T standards

Position Requirements

- Coordinates and oversees CAD development throughout project.
- Creates protocol for revision management, manages CAD files,
- Ensures CAD model matches physical design.

Salar Golshan (ENFJ-A) - Manufacturing and Co-Test Engineer

Salar is a proactive thinker and works hard to attain results. Salar is also part of a Fraternity and is familiar with running teams and training individuals. Being an ENFJ (just like Ryan) Salar is very apt to understanding social dynamics and strives to lead the way to a brighter future despite the obstacles.

- Has experience with SolidWorks, Wind Turbine Design, and MATLAB
- Extensive hands-on time with manufacturing design of SUNTRAC Solar Panels; thermal heating to heat and cool coolant for AC Units.
- Skilled in problem analysis, analyzing a situation in multiple different approaches and selecting the most effective.
- Proficient in recording test data, collecting and setting up experiments.

Position Responsibilities:

- Plans the process and coordinates fabrication of design.,
- Reviews design at all steps, ensures design can be manufactured,
- Finds outsourcing opportunities manufacturing cannot be done in-house,
- Develops schedule of manufacturing.

Test Engineer: Oversees experimental design and testing, plans testing procedures, acquires necessary equipment for testing, runs all tests for team.

4. Ground Rules:

The team has agreed to meet on Fridays at 2:00PM through Microsoft teams, and in person if necessary. The ground rules that the team has agreed upon are as follows:

1. If a team member has an idea for the design, they must convince the other team members of their idea by backing up their proposal with facts and a strong analysis as to why it is beneficial to the design. Examples of these could be a financial analysis to show that the new idea would save the team money, or a force analysis (back of the envelope calculations) to show that the new design is more efficient at distributing a load.
2. If a general consensus is not reached, the team has decided that it will pass if 80% of the team agrees to that idea. This means that four out of five team members must agree to implement the design for it to be put into action.
3. The team will have an open mic style discussion during meetings, where team members are free to voice their opinions or concerns at any time. The team has agreed to let everyone voice their opinion without interruption before anybody can respond. This open

mindset style will allow the team to consider a myriad of design concepts and allow for the team environment to remain positive.

4. Team members with dissenting views will be allowed to propose their views in a team meeting without interruption. The team will then express their opinions and concerns about their ideas, and the team will decide on which idea is the most beneficial to the team. If it is an idea related to design, the team will use rule #2 to aid in the decision-making process.
5. The team has agreed to participate in every team project equally. Team members who do not perform or confide by the rules above will discuss with the team why they are not performing or following the rules. If the lack of performance or disagreement to follow rules continues, the team will ask the team member in question to attend a meeting with the team and Dr. Willy to figure out what can be changed to better benefit the team.

5. Potential Barriers and Coping Strategies:

One of the most common issues that teams face is the different mindsets, beliefs, and approaches individuals' strategies to deal with problems. Throughout the semester, the team understand it will be stressful to deal with our classes and personal lives. The most important approach to this barrier will be maintaining an open mindset so all the viable solutions to the problem at hand can be clearly analyzed.

With these busy schedules, this team of five will endure some time conflictions. The team hopes to meet in person during critical times of the project, finding the perfect day and time that best accompanies the whole team will be difficult. During these times, the individuals that cannot make the meetings either must meet over Microsoft Teams or be filled in on the discussions and assignments later. It is expected from these individuals that they complete their fair portion of the task within the required amount of time.

In past projects, the team has endured certain teammates that were not willing to participate and put in the same amount of work as everyone else. The team has agreed to a system where accommodation is provided to the lacking individual with providing sufficient reasonable time to complete their tasks if they are going through times of hardship, etc. If the individual is still not providing their fair share of work, the team will talk to the teammate 2 times total, then the team will contact Dr. Willy to assist in further management of the team.

For all other systematic issues, a communications plan has been erected and is described below. Project participants communication strategy was discussed during the first team meeting to tackle individual performance. The team reached on using Microsoft Teams for project documents and storage and to use phone group text message service to communicate with each other.

In addition to this, the team meets 2 times in class and twice outside of class to discuss key elements of the project and to work on the required deliverables. Follow through on assigned tasks will be monitored by team lead and the project coordinator. The communications plan is provided below in Figure 1.

Table 1: Communication Plan Matrix

Project Communications Plan			
Communication	Frequency	Goal	Owner
Project Status Report	Weekly	Review Project status and discuss potential issues.	Team Lead
Team Standup	Bi-Weekly	Discuss team member tasks and progress.	Team Lead
Task progress updates	Bi-Weekly	Share individual team member progress.	Team Lead
Project review	Weekly	Assess reports and tasks, provide feedback	Team Lead