

Project Team Charter

ME476C: Capstone I

Signature Cover Page

Each team member will copy the following statement in their own handwriting (LEGIBLY) in one of the designated areas below:

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: Davis Geniza

Signature: *Davis Geniza*

Print Name: Ryan Fortier

Signature: *Ryan Fortier*

Print Name: Zhiyu Wang

Signature: *Zhiyu Wang*

Print Name: Alec Boyce

Signature: *Alec Boyce*

Print Name: Oscar Nunez

Signature: *Oscar Nunez*

Team Purpose

Individually, each student must complete capstone in order to finish NAU's engineering program. As a team, the purpose of this project is to create a Remote-Operated Excavator, which will be electrically powered and remotely operated via cameras and controller. Furthermore, pipe and cable detection will be an implemented feature and a garden-sized prototype of the excavator will be manufactured which can be scaled in size.

The stakeholders for the project include the team, NAU, and the client, Dr. Trevas. The project aims to enhance professionalism and teamwork in a realistic engineering team setting, while the team expects to deliver a product that satisfies all customer needs. The team is optimistic that this experience will provide knowledge on building team chemistry within a new engineering team environment, complimented by expanded communication skills during stressful circumstances and design challenges. Ultimately, it is expected that each of the customer needs can be efficiently and cost effectively designed and manufactured, providing skills that can be used in future industry or research applications.

Team Goals

As Mechanical Engineering seniors, the concept of project success, at this stage in our academic careers, is not something that is new to our team. As a result, Project goals, Process goals, and Quality goals will all be intertwined with each other. Having said that, our project goal is to construct a remotely operated excavator that satisfies all the criteria specified by the client. The process that we have adopted for our project is as follows, 1. Identify Needs, 2. Project research, 3. Develop engineering requirements, 4. Concept development, 5. Product development and the goal for our process is for it to be easily repeatable. This leads us to the quality and the quality goal for our project, which states we shall refine our overall goals and processes accordingly in order to achieve the highest quality product attainable within the scope of our project.

The main goal of our team is the overall success of our capstone project, which ties the team performance goal directly to our project goals and our overall course grade goal. As is the case with any other team, each member brings with them varying levels of experience and skill. Having said that, each member will commit to an equal amount of work at the same level of the other members in pursuit of a team course grade of an A. Setting these team goals will give each member something to work towards and will allow us to solve problems as a group. As a result, we understand that the overall success of our team and project will be primarily predicated around these goals and the collaborative efforts of the team.

Roles and Responsibilities

Project Manager – Davis Geniza

Budget Liaison – Ryan Fortier

Client Contact – Oscar Nunez

Website Development – Zhiyu Wang

Documents Manager – Alec Boyce

Oscar has personality traits that allow others to communicate with him easily and comfortably in every form of communication. He is somebody who likes to take notes and is great at relaying information from one setting to the next, making client contact his best position.

Davis is somebody who likes to know as much as possible about a task before completing it, to ensure that his work is done in the best possible way. He is also somebody that can take charge and lead a group by involving himself in the group as another member and not just somebody in charge, which makes him an ideal project manager.

Alec is a very organized person and is very well spoken. He is meticulous in every aspect of his life which ensures quality work and makes him a great documents manager.

Zhiyu is very experienced with technology and enjoys to customize and create things for the best look and feel. He is very open to exploring new ideas brought to him by his peers and asked to be the website developer because he feels extremely confident that he can do very well.

Ryan is the type of person that always looks for a great deal when purchasing anything. This skill is useful when creating a budget and made him an easy choice for budget liaison. He also is somebody who is always willing to help others, which means that he will be assisting the team in any way needed, because the design of this project will not require much purchasing, if any.

Ground Rules

The team plans to meet before client meetings at 10am every Tuesday and Thursday. Client meetings are at noon on Tuesday Thursday and meeting before will allow us as a team to be coordinated and prepared for the client meeting. As a team we agreed upon several norms and ground rules such as being on time to meetings and having our assigned work done at least 1-2 days before the deadline in order to stay organized and on schedule. Other norms such as participation during meetings and a rotation of meeting minutes were discussed and implemented into the ground rules. Timecards will be filled out and ready to be submitted by Saturday to prevent missing the Sunday deadline.

Conducting team meetings before client meetings on Tuesday and Thursday will allow us to be prepared and organized as a group for the client meetings. During these team meetings the team will conduct

discussions and make decisions on important aspects of the project. We plan on making decisions as a group and everyone in the group has an equal say in the decision-making process. We will hold each other accountable to follow the ground rules and norms that have been established. During team meetings the team will ensure that all team members are progressing on tasks assigned and that they have a good report for the client.

As a team we expect everyone to participate in team meetings and be up to date with action items. The team leader will ensure everyone is on track but its ultimately up to the individual to ensure the completion of assigned tasks. We plan to meet over zoom in order to remain in the guidelines of social distancing. The team leader will ensure that everyone has been fulfilling their roles and responsibilities as well as at the beginning of meeting deciding who will be recording meeting minutes.

Barriers and Coping Strategies

Regardless of how coordinated the team's planning may be, there will always be the possibility of barriers impeding team operations. Presently, with a global pandemic, capstone being an online course does create known and unknown barriers that will challenge the team. The inability to frequently meet in person, utilize NAU's resources that were once unregulated, and varying locations are a few examples of known barriers due to this circumstance. A future unknown barrier that can be caused by this same issue could be one or multiple team members contracting the virus, which would inhibit the team's productivity and role responsibilities. This scenario is unprecedented for the team, and guidance will be needed from faculty if the virus infects a team member, as it is possible that the barriers created such an event could impact the team for weeks.

Barriers that can be expected with or without a pandemic, can of course affect the productivity of the team and its operations. These barriers include uncertain deliverables, differing work styles, varying personal and professional schedules, and communication failures, although we have all dealt with these issues before. Furthermore, barriers such as future design complications are almost certain throughout capstone and must be solved in order to deliver a satisfactory product to the client. The answer to coping with these possible issues require the utilization of resources such as guidance from the capstone professors, who have many years of experience working within a team for various engineering projects. However, these resources are only meant to guide the team, while trust, communication, and flexibility are imperative to accomplishing the team's goal.

With respect to operations being hindered by the pandemic, communication and sacrifice will be key to coping with these barriers. While the entire team is not located in the same city during 476C, communication can bridge this dilemma, and technology such as Zoom and Microsoft Teams will allow the team to operate as if together. Furthermore, perseverance and trust in the knowledge that was gained throughout the engineering program can help the team tread the unforeseen and unprecedented challenges that will be faced throughout capstone. Communicating a challenge will allow other team members to provide support, and plan ahead to keep deadlines and goals manageable.