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:
Drew Bandhauer

Signature:
Drew Bandhauer

Print Name:
Cole Jennings

Signature:
Cole Jennings

Print Name:
Drake Cleveland

Signature:
Drake Cleveland

Team Charter for Senior Capstone Design Project

1. Team Purpose:

This team has been created in hopes of developing carbon free heat generation for a water heating system at NAU's engineering building. The team must generate enough solar thermal energy to reduce the overall BTU consumption by NAU's water heaters. NAU's GreenFund is the main stakeholder and sponsor for the team, and require a cost-neutral design at a minimum. The design must also maintain no carbon emissions thus lowering the campus's overall carbon footprint for heating and cooling.

The team must establish a location for the solar field in question, develop a delivery method for the heated water, and run diagnostics of the completed design. If the design is successful and cost effective, it may be replicated for other buildings on NAU's campus thus lowering the carbon footprint exponentially.

2. Team Goals:

The Senior Capstone is the culmination of at least 4 years of higher education and is an opportunity to apply the knowledge gained to a real-world problem. The scope of the Thermal Solar project allows for the research and analysis to end with implementation of the team's design, funded by the NAU GreenFund. With this in mind, the team is committed to achieving this end in any way that we can. All members have an interest in gaining valuable experience from this project, while also making a difference around campus. The team plans to exceed the expectations of the project Sponsor and Advisor and develop a design that will be implemented. The team understands that a considerable amount of work and research will need to be invested for this to happen, but the team is up to the task.

The possible outcomes for this project have been discussed with the Project Sponsor and Advisor. Either the team lays the groundwork for a future team to complete the project, or the team can develop a design that satisfies the customer requirements and will be implemented. The preferred outcome will involve actual implementation, but laying the groundwork for a future team would also be considered a success. The challenge is that the Solar Panels would need to be installed after just a semester of research and analysis. The team recognizes that this is a daunting task, but an achievable one.

With all of this said, the team has agreed to put forth the necessary work to achieve design implementation.

3. Team Member Roles/Responsibilities:

Drew Bandhauer will remain the team's project manager, thus monitoring all work done by the team and facilitating meetings.

Cole Jennings will be the team's client contact and budget liaison. Cole will be in charge of all external contact for the team and monitor the budget of the team and make executive decisions for purchases based on this.

Drake Cleveland is the team's document manager and website developer. Drake will be in charge of managing and storing all work created by the team in an organized manner. Secondly, He will develop a website which markets the team in a professional and effective manner, ensuring all pertinent documents are easily accessible to the public.

Role Title	Role Description
Project Manager	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)
Client Contact	Manages external communication (point of contact for client) All communication with the client must be through this person.
Budget Liaison	Oversees all purchases, main contact with Front office for budget management, monitors and records all purchases for budget tracking, updates Bill of Materials
Documents Manager	Maintains repository for all documents including CAD models, computer codes, standards, references and meeting minutes and agendas. Not the designated note-taker – that role should be rotated among the group.
Website Developer	Posts the group's work to the team's official website. All members are responsible to contribute content, and the website developer will decide how it is presented.

4. Ground Rules:

The team has opted to create a google drive to easily store and share documents, data, etc. As such, meetings may be held via video call or in person, and will be held multiple times throughout any given week. The team has agreed to consult each other on any and all executive decisions while remaining in their specified positions. Similarly, a majority-rule voting

process will be used for all important decisions after in-depth discussion has ceased. Dissenting views between group members will be handled in a similar method, following in-depth discussion and an agreed-upon open mindset. Level-headedness will be an understood quota each member in the team needs to meet.

Each member has signed and agreed upon this team charter and as such have agreed to the rules stated above. If dissenting views and violation of these rules become prevalent, the other teammates will remind the member in question of their document signature. If further violations occur, the other teammates will overrule the member in question, rendering their grade distribution by the team lower.

It is expected that each member of the group provides an equal commitment level. The standards agreed upon by the team will set the precedent for this level of commitment, but may vary from week to week depending on the level of work needed for that time period. Certain parts of the project may favor one member's skill set more than others, and this commitment level will also vary in lieu of this. Repercussions for lack of commitment fall upon the other team members and their evaluation of this during the grade distributions.

5. Potential Barriers and Coping Strategies:

The team has identified and discussed potential barriers to completing this project. Scheduling conflicts appear to be the biggest obstacle for the team this semester. In order to combat this, the team has created a shared excel sheet to update with their schedules. This allows each member to have access to a centralized schedule and determine when everyone's free times are.

Prior teamwork opportunities provide insight to group struggles the team may encounter. The most prevalent of these is a lack of equal work. It is common that certain members of the group tend to do less work than others, and this creates issues in team camaraderie which creates further tension in the group. In order to combat this, a Gantt chart will be created to divy up equal amounts of work to ensure no members of the team are doing more or less work than the others. This will also create a sense of urgency for the team and keep the project on track as intended.

The second most anticipated barrier of the team may arise in conflicting opinions or ideas. It is likely that multiple members of the team will have different opinions regarding decisions in the capstone project. To combat this, the team plans to operate with effective communication skills and openly respect the opinions of others. When the communication within a team is open and honest, the work quality will be higher and the team's overall production will be better.

GROUND RULES FOR DIFFICULT GROUP DISCUSSIONS

Ideally, group discussions should be calm, focused conversations in which various ideas and opinions are considered, leading to useful, productive outcomes. But in the real world, many groups just can't pull this off. When members have conflicting interests, personal agendas, or aggressive personalities, meetings often deteriorate into angry conflicts, thereby wasting time and harming relationships.

If you anticipate that your group could head down this destructive path, try to get agreement on how the discussion will be conducted before leaping right into the issues. Unless they just enjoy anger and hostility, group members will usually agree to a reasonable set of Ground Rules. Then, if things start to get out of hand, the leader or facilitator can simply remind the wayward members of their previous agreement.

Although each group may have specific needs, the Ground Rules listed below are often useful. (These can apply to personal conversations as well.)

1. **Stay focused on the purpose and goals.** The group should clearly define what they hope to accomplish at the beginning of a discussion. This makes it easier to determine when people are getting off track.

2. **Listen when others are speaking.** During difficult discussions, people often mentally rehearse their next comment while someone else is talking, with the result that no one is really listening. When this happens, the conversation tends to turn into a pointless debate.

3. **Be sure that all viewpoints are heard.** Since most groups have both talkative and quiet members, efforts should be made to invite the quiet people to share their thoughts and keep the talkers from dominating the discussion.

4. **Consider different points of view.** People easily get "locked in" to their own opinions and don't even think about the possible merits of other ideas. Members need to be encouraged to think beyond their own point of view.

5. **Look for areas of agreement.** Argumentative group members often agree on more things than they realize. Before discussing disagreements, members should identify the things they do agree on.

6. **Discuss differences respectfully.** Hostile, insulting remarks add nothing to a group discussion and often permanently damage relationships. Members should be reminded about basic "good manners" for meetings.

7. **Remember that facts can be wrong, but opinions are just different.** Most of the time, people are not arguing about facts, but expressing differences of opinion. However, they often act as though their views are "right" and others are "wrong". It helps to recognize that they are simply different.

8. **Look for the good points in new ideas.** Useful ideas may get rejected when people are too quick to find flaws. By initially exploring the benefits of an idea, the group can avoid becoming overly critical.

9. **Focus on the future, not the past.** Disagreements can easily deteriorate into finger---pointing about past mistakes and problems, which accomplishes absolutely nothing. Use past experience to inform your decisions, but focus the discussion on future goals.

10. **Look for solutions, not someone to blame.** The worst debates about the past are those which involve placing blame. Any conversation focused on blaming is unproductive and should be turned into a search for solutions.

11. Don't use group time for individual issues. When two or three members start discussing their own issues in a group meeting, it just wastes everyone else's time. If this happens, the people involved should be politely asked to continue their personal discussion after the meeting.

12. "Sidebar" any issues that are important but off-‑topic. Occasionally, important matters are raised that have nothing to do with the goals of the meeting. To keep the group on task, but avoid losing the issue, create a "sidebar" where these topics can be listed and dealt with later.

13. Agree upon specific action steps. In most situations, members need to end the discussion with specific "next steps" that can be acted on after the meeting. Otherwise, the whole thing may turn out to be a waste of time.