

Project Team Charter

Senior Capstone Design

Signed copy of charter is due by date posted on Bb Learn

To create a team charter for your capstone project, follow these steps:

1. Schedule a face-to-face meeting that all group members will attend.

2. In advance of the meeting, all group members should:

- a) Review the attached “Ground Rules for Difficult Group Discussions.” These documents contain helpful information and useful parameters for team conversation and discussion.
- b) Review the attached team charter form and prepare your input for the meeting. Every team member is expected to contribute to charter development.
- c) Review their MBTI personality styles. Be prepared to discuss how each team members’ personalities will influence the group and the project.

3. During your meeting:

- a) Designate one team-member as project manager. This person will be a single point of contact for the team.
- b) To ensure that everyone’s ideas will be heard and considered, establish a protocol for sharing team member input on charter contents. For example, will each team member present all prepared input up front, or will you share input and develop the contract section by section?
- c) Using the protocol you’ve agreed on, conduct a group discussion that results in a team charter for your senior project.
 - Take this discussion seriously and participate fully. The power and success of your team’s charter comes from the conversation and agreements on which it is based.
 - Moreover, **the roles and responsibilities documented in your charter will provide the concrete benchmarking data for assessing one another’s project participation in the peer evaluations.**
- d) To formalize the specifications and agreements documented in the charter, all team members must sign and date this contract prior to turning it in. In addition, the team (or a designated team representative) must review this contract with your instructor, who should also sign the contract.

4. During the term:

This charter is a living document, and the roles and responsibilities specified herein are the benchmarks by which you and your team members will be assessing one another’s performance at semester’s end. **If any of the team member roles and responsibilities specified in this document change during the course of the term, revise the charter accordingly.**

Team Charter for Senior Capstone Design Project

1. Project Manager: *Identify who will be the team's project manager*

Team B's Technical leader, Tristan Scott, was elected by the capstone team and approved by project advisor David Willy.

2. Team Purpose: *State the reasons for this team's formation and the team's purposes. Who are your stakeholders, and what are their expectations of and for the team?*

The Collegiate Wind Competition (CWC) capstone project is a multidisciplinary project requiring multiple students from different majors to collaborate and drive the project to completion. The project will be divided into two (2) main teams, the Deployment Team and the Test Team. The Deployment Team will work with business students in creating a business plan for a large scale wind turbine. The Test Team will require multidisciplinary engineering students to develop a functional wind turbine to be tested at the CWC in Chicago. Furthermore, the Test Team will be divided into Test Team A and Test Team B. Test Team A and B will NOT be segregated into mechanical and electrical design to maximize communication between multidisciplinary students. Test team B will be responsible for: hub, rectifier, nacelle, brakes, yawing, load, and tower design.

The main project stakeholder for the *Collegiate Wind Competitions* is the *U.S. Department of Energy* (DOE). The DOE expects a functional wind turbine that meets the requirements set forth by the *CWC 2018 Rules and Regulations* document. This stakeholder also expects that the team can create a business plan and complete a wind power citing challenge. Professor David Willy is the faculty project advisor and one more important stakeholder for the capstone project. Dr. Willy expects that the team can collaborate with a cross functional group to develop a competition worthy wind turbine that meets the requirements set forth by the *U.S. Department of Energy*. Professor Willy also expects that the capstone team is able to apply engineering knowledge, concepts, and the design process succeed in developing a functional wind turbine for the competition. Dr. Oman as the professor facilitating the capstone course is yet another project stakeholder. The expectations that professor Oman has for the capstone team is that we are able to work diligently and professionally to complete the required work imposed by the capstone class. Dr. Oman also expects that the team is able collaborate with cross-functional groups, apply the engineering design process, and engineering concepts to develop a functional wind turbine that meets the requirements set by the Department Of Energy.

3. Team Goals: *What are the team's project, process, and quality goals? To what level of performance are team members willing to commit, and what course grade are you collectively aiming for? Articulating these goals will make a difference in your team's performance.*

The team's process goal is to develop a team of varying disciplines who all contribute equally to the project so that the workload is delegated evenly, and executed within a reasonable time frame. It is important for team members to follow through with tasks that have been assigned and communicate with the team early if the work will not be completed either by the assigned party, or within the assigned constructs. This will help the team stay true to its process goal, and insure success come May when it is time to compete. The quality goal of the team is to deliver professional work worthy of displaying in front of other competing schools and the wind industry as a whole. This will be accomplished by creating deliverables that reflect hard work and a strong understanding of engineering

concepts learned. Team members must be willing to commit to working extended hours on the project, in order to create and deliver quality work deserving of a top three placement at the competition. Collectively, the team is aiming to obtain an “A” in the capstone class.

4. Team Member Personalities/Roles/Responsibilities: *State each team member’s personality style and what they can bring to the group. While some team responsibilities are shared by all members, collaborative teams work best when members also have unique roles and responsibilities. These could be technical and/or project management-related. The required positions for this course are: Budget Liaison, Client Contact, Website Developer, Project Manager, and Secretary/Document Manager. Develop other positions so that each person on the team has a defined role. Consider these assignments carefully. This information will constitute the benchmarking data for your end-of-term peer performance evaluations. Each team member must have a defined role and responsibility in the group.*

At this stage of the project, Team B has seven team members working together on specified components. Dakota Sallaway is the lead designer for the nacelle and tower components of the test wind turbine and is an ISTJ. Dakota is dedicated to his work and has experience working as a TA for ME 286 design and has previously worked with Novakinetics Defense Manufacturing. Being a TA for the ME 286 design will benefit the team by having more developed knowledge of the design iteration processes learned in the course. The connection to Novakinetics will help the team have access to stronger and industry grade blades for our test turbine. Spencer McMahon is the lead designer on the hub component of the test wind turbine and is an ESTJ. Spencer has previous machining experience and plans to use this experience to benefit the team as a whole. Being an engineering intern in industry has helped him develop project management skills that he will use to drive his own project goals along with the goals of the team. Jacob Peterson is the lead designer on brakes and yaw systems for the wind turbine test team. Jacob is a dedicated worker, a persistent perfectionist, and an INTJ personality type. From which, Jacob’s goals are to develop quality deliverables and promote strong interdisciplinary team communication. Tristan Scott is the Technical Lead for Test Team B and is an ESTJ. Tristan is a strategic planner and has experience in collaborating on projects through his internship with Raytheon and working on large teams from previous employers. Tristan’s dedication to strong communication and hard work will help the team to accomplish their goals. Alex Dahlmann is the Test Team Manager and is also an INFP. Alex’s drive for knowledge and strong interpersonal skills make him a natural leader, and an asset to the management team. Benjamin Macleod is the technical lead of the load design for the wind turbine test team and is an ENTP. He brings strong skills from excelling in classes and projects involving power electronics and is willing and capable to work with anything that you give him. Yousef Alali has experience in building electrical circuits and working on generators, which will help the team to build an efficient wind turbine. Yousef worked on building a wind turbine and a generator that was made on the idea of ohm’s second law. Yousef will use the experience from projects he has worked on to help the team in succeeding. He is an ENFJ.

The leadership team is responsible for sorting the rest of the team into smaller groups based on interest and experience. This is a large task because the team is comprised of 12 mechanical, and 7 electrical engineering students. These students have unique experiences and strengths to add to the group. Over 50% of the group has had a renewable energy technology course such as Wind Energy Engineering, or Power Systems, and over 40% has had relevant projects in their 386 classes such as blade design, or DC to DC converter design. More than 75% of the students have engineering internship or management and communication experience. All members of the group will contribute their unique views to the project, aiming for success at the competition in May 2018.

5. Ground Rules: *How and when will this team meet? What are the norms and ground rules the team will agree to? How will you conduct discussions and make decisions? How will you handle dissenting views among members? How will you hold each other accountable for living by these rules and for task completion? What kind of participation and level of commitment do you expect from one another? [Each team is required to meet at least once a week outside the allotted class time. It can be hard to coordinate schedules, so get it done early in the semester. All team members are expected to go to all team meetings.]*

Other than the established Capstone class, the team will be meeting at least once a week. This will happen in the engineering building with the room to be determined based on availability. During the team meetings, students are expected to present ideas and researched justification for the topic at hand (i.e. Overall system, blades, DC-DC converter, etc.). Other students should respectfully consider the options presented and identify any faults or benefits that could result from its application. Decisions (regarding components to the overall system), should be discussed with the teams directly impacted and voted on (for example: if the generator team makes a decision regarding generator type, the conversion teams should also be in the discussion). All team members are expected to be respectful at all times and should any dissenting views arise, team members are expected to be professional about solving the problem.

The scope of this project requires that all students involved must remain actively working to meet the rigid deadlines. Communication between teams is crucial and must occur often to secure a fully functional system. Periodic memos from our team containing information such as progress, current issues, and other details that may be important, should be created and sent to all team leaders a minimum of every two weeks. Our team lead is expected to maintain an active Gantt chart that needs to be updated and sent out with every memo. The Deployment and Test teams need to be in constant communication to verify all components align.

6. Potential Barriers and Coping Strategies: *What barriers to effective teamwork might potentially arise in the course of completing your senior project and other team obligations, and how will you handle them if they materialize? What problems with team dynamics have you experienced in the past, and how will you handle them if they come up again?*

Due to the sheer size of the CWC capstone project, teamwork can be hindered through a lack of communication, misunderstandings between teammates, and scheduling conflicts. Successful teamwork includes understood communication between teammates. Therefore, to keep quality communication between teammates, we will have a team drive on Google Drive, a group text, and frequent meetings. Our team has components that each member will be responsible for relating aspects of the wind turbine project. This will help keep communication flow on relevant topics going through their respective components. Questions that teammates may have on certain aspects of the wind turbine will be able to direct themselves to the correct sub-teams and then the correct subject matter expert.

Our sub-team will meet weekly outside of the capstone class to advance on tasks assigned to our team. Every other week, the CWC capstone team will meet as a whole to discuss the overall progress of the project and discuss any issues that have been encountered. This means that every other week, the capstone team will have at least one meeting with the small sub-group and one large meeting with the entire capstone team.

7. Charter signed and dated by all team members and given to the instructor (legible signature, please!). Attach the following page to the front of your team charter.

Project Team Charter

ME 476C: Senior Capstone Design

Signature Cover Page

By signing this document I fully understand that it is my responsibility to be the best teammate possible I can for my team. This means being on time and contributing to all meetings and work related to the project - which includes all course and client driven deliverables related to the team. I will not only complete my tasks as required but I will complete them on time (ahead of time if needed) and I will deliver material of the best quality to represent my team as a whole. Whenever needed, I will ask for help when I struggle, help my teammates when they struggle, and I will communicate clearly and directly on all issues related to the project.

If I do not contribute as required, I understand that my grade could be curved down for poor performance. Evidence of poor performance will be documented in peer evaluations and instructor observations throughout the semester. **Specifically, poor performance from two or more teammates in any given peer evaluation cycle will trigger a grade change on related team deliverables. Furthermore, instructor observations during staff meetings, lectures, and presentations can also trigger a grade change on team deliverables.**

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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.