

## Tips for Working Effectively in a Group

Working together efficiently does not just happen; it requires discipline and active leadership. Learning how to work effectively in a group is one of the most challenging aspects of this course, as well as industry. The following tips offer proven methods to promote cooperation.

1. **Communication is key when it comes to teamwork.** *Learn to listen* as well as you speak; give every member's ideas the same consideration you give your own. **Resist the urge to interrupt.** Clarify your understanding by summarizing other members' comments. If your members seem hesitant to express themselves, take the lead by voicing your own ideas. Saying what is on your mind will demonstrate to your group members it is okay to take risks and it will encourage a positive group dynamic. **Clear and direct task assignments and evaluations are essential** for tasks to be completed properly within the allocated time frame.
2. **During the design phase, everyone should share tasks.** Since **all** design work must conclude before manufacturing can commence, everyone must **work on the design together** to do the best job possible in the allotted time. **Everyone** should participate equally on the design work and CAD modeling/assembly; that means **everyone** models parts, **everyone** makes drawings, **everyone** checks drawings and **everyone** works together to complete and check the calculations and written portions of the design reports. Do not let anyone use the excuse *I'm not very good with CAD*. If you hear that from team members, assign them extra work since they need the practice; or ask if they are planning to mention that weakness during their interviews as well. **Reward results, not excuses.**
3. **All team members should participate equally in the design phase and thus understand how every part of the final design works.** If you don't know, ask questions until you do. When asked a question about your group's design, if anyone replies *I don't know how that works; I didn't design it* they will be asked to stop working until they do. **Participate equally and take ownership and pride in the evolution of your group's final design.**
4. **During the manufacturing phase, everyone should work on separate tasks.** Each member of your group received the same training, so **everyone** should be capable of manufacturing **any** parts for the robot with the help of the TAs. If any part of the project requires a second set of hands or a reminder about how to use a piece of equipment, ask a TA. **Do not work in pairs on the machines or to perform the same assembly task, because the second person is just wasting time he/she could spend doing something more useful and helping increase the amount of time the team ultimately has for testing.**
5. **Failing to plan is planning to fail.** Groups that don't plan their work and work their plan will have little or no time for testing; **the results will not be impressive.** Take even the small assignments seriously. If you don't, you will fall behind and become overwhelmed. **Stay on track** and invest genuine effort into the design; doing so will pay dividends in the later portion of the course.

6. **After planning your work, work your plan.** The best plan is useless if not executed well. Set a *regular weekly meeting time(s)* outside class to discuss exactly what each member should do during the next lab and what help you'll need from each other and the TAs. *Adhere to a consistent meeting time each week to maximize team attendance.*

Many students waste the first 15 minutes of lab just getting started each week, so *come to lab prepared*: review specific tools and materials you will need and bring questions to the TA hours prior to your lab session. *Prepare paperwork like CAD drawings, budgets, schedules and purchase orders outside of class* so you can maximize your time in lab measuring, manufacturing, assembling and testing.

7. **Never accept excuses.** If your team falls behind, discuss how you're going to work more effectively. **Clearly identify anyone who is not working diligently or is behind on their tasks.** *Never accept excuses from group members or their behavior will only get worse* when they see it's okay not to accomplish their part of the project. Rather, (in a respectful manner) *be open* with one another; *place blame where it belongs* (i.e. coming to a meeting unprepared, procrastinating on an assignment, not reading directions, etc.) and *agree on a solution*. Most of us miss a deadline on occasion; it's how we deal with the missed deadline that distinguishes good workers from bad; *accepting responsibility is crucial*. If you realize you're not going to make a deadline, inform your team in advance so it can shuffle resources to get the work done. *Showing up to a meeting or lab without your part(s) of the assignment complete is unacceptable and disrespectful.*

8. **Maintain good team meeting documentation.** Unfortunately, it's not uncommon to find that someone in your group doesn't care about what he/she is doing. As stated in tip #7, this situation is best resolved by clearly communicating to this person their failure to accomplish the assigned tasks and making it clear that he/she is expected to do an equal part of the work load. If their behavior doesn't change, disciplinary action is required (i.e. [poor peer evaluations](#) in the course, poor feedback to their boss or manager in industry, etc.). For this to be an effective tool, you must document problems encountered with team members. **Everyone is required to keep notes of each meeting: what topics are discussed, what tasks are assigned to whom and the associated deadlines, as well as who doesn't attend, who has excuses and who didn't accomplish their assigned work from the previous meeting(s).** At the end of the semester, if there's an isolated case of someone just having a tough exam week and not completing one task, it can probably be disregarded, as it will happen to the best of us. **If, however, a member habitually has excuses, submits assignments that are half complete or of poor quality, rarely attends agreed-upon team meetings, always leaves meetings early, claims to not be good with CAD, manufacturing, writing, etc., then list this on the peer evaluations submitted in the course.** Remember the shortest pencil is longer than the longest memory, so maintain accurate notes during the semester. Note taking is often an effective tool because the observation that others are keeping notes about poorly performing team members is enough of a deterrent for behavior modification, which is the desired outcome: for everyone in the group to invest fair and equal effort toward completing the assignment. You can download the required and effective [meeting template](#) off the course website.

9. **Use a collaborative work sharing system** like [MS Teams](#) or [Slack](#) to share files, deliverables, meeting notes, and assignment progress with all your teammates. Programs like this combine file sharing capabilities of [Dropbox](#) with collaborative communication tools common in [Google Suite](#) to give your group a powerful way to stay connected and on top of each week's deliverables. A few hours spent early in the project implementing a few of these intelligent communication tools can greatly reduce the length of weekly group meetings, while simultaneously increasing their efficacy. **We will be using MS Teams exclusively this semester in DML; instructions for which will be sent out soon.**