

Chemical Engineering is a versatile field whose practitioners can have highly-rewarding careers in biotechnology, advanced materials, energy, manufacturing, and more. Conducting research while pursuing your MS degree affords you the opportunity to hone your craft in a unique team environment while working on cutting-edge research. Obtaining a good job at the MS level or gaining entrance into a PhD program is very competitive and will require that you establish a strong track record of scholarship, as reflected by your academic transcript, letters of reference, and your research output. It also requires a high degree of professional motivation and good laboratory citizenship. *As your advisor, I am here to help and guide you, but, ultimately, your success is determined by the work you do and the impressions you make.*

1. Research hours (During the Semester) – It is my expectation that you will spend at least 8-10 hours per week working on your research project (Consistent with what you should be spending on a 3 credit hour lecture-based course). What you do with your time beyond this is what will define you as a scientist, and this extra time may be very valuable for truly learning a new technique, finishing up a series of experiments, and/or writing a publication on the research you have conducted. When you have a busy week with exams and/or projects, it is perfectly fine to spend less time on research, but make sure that you communicate this with your mentor and I, and try to make up for lost time on less busy weeks.

2. Research production – The results/data you obtain and papers that you co-author represent a major form of currency for your future career advancement. As a MS student, you have a relatively short amount of time to conduct research compared to PhD student, and some projects are inherently more difficult than others. While the amount of data generated will naturally vary from project to project based on differences in the scope of work and type of experiments/analysis being conducted, it is my general expectation that you will make significant contributions to the project you are involved with such that results you obtain can be incorporated into a publication.

3. Laboratory citizenship – We are a *team* and, while I do not expect everyone to be best friends, I do expect maturity, civility, and respect at all times. I also expect that you maintain a spirit of helpfulness when working with your colleagues (e.g., ask for and offer help, volunteer to help with lab cleaning, troubleshooting instruments, etc.). Finally, recognize that while many projects work towards a common goal, projects are never set-up so that lab members are in competition.

4. Group meetings and regular meetings with your advisor(s) – You are expected to attend all group-wide meetings, which are typically held once a month. We will also hold weekly sub-group meetings in order to keep track of weekly progress. However if you have exciting successes or unexpected challenges, please continue to find me outside of these allotted times. You should come to sub-group meeting *prepared* to give an update on your research efforts from the previous 1 or 2 weeks and with ideas to discuss for the following week. If you are sharing data/results, you should bring key plots / images that are clearly labelled. For all meetings, I expect that you will do your best to show up on time so that we can make the most of the scheduled meeting. If you are unable to attend the regularly scheduled meeting, send me an email ahead of time so that we can reschedule the meeting.

5. Literature review – You are aspiring to be *scholar*, not a skilled technician. This means gaining a deep understanding of the research literature related to your own project. To this end, you should be constantly reading literature pertaining to your project. If you have problems comprehending the subject matter, you are expected to seek help from textbooks, the internet, your peers, and your advisor(s). Be sure to become familiar with literature retrieval systems (e.g., Web of Science, google scholar).

6. End-of-semester slide deck “report” – At the end of the semester, you are expected to email Dan and your research mentor(s) a PowerPoint slide deck that serves as an informal “report” containing a summary of the research you have done throughout the semester. This will be used to help assess the progress you’ve made, but I hope this will also be a valuable exercise to reflect on the research you’ve done over the course of the semester and be beneficial to you and other researchers who continue working on the research project in future semesters. The submitted slide deck should contain (i) several slides describing the background, motivation, and research question(s) that are central to your project, (ii) slides describing the research approach, methods, set-ups, and/or procedures that were especially important for your research, (iii) a detailed list of experimental conditions/chemicals/materials/modelling assumptions (when applicable), (iv) 5-15 slides summarizing key results (not all results) obtained throughout the semester, (v.) a conclusions

slide, and (vi.) a “Future work” slide with bullet point list of next steps you recommend taking in the research project. You are encouraged to develop these slides throughout the semester as a part of updates that you give as a part of weekly subgroup meetings, which will hopefully make assembling the final slide deck a light lift at the end of the semester. I ask that you turn these slides in before the first day of exams.

7. Course work – Excelling in the classroom without sacrificing your research activities can be a challenge. Discuss your exam schedule and learning strategy with me on a regular basis. I can help you with a plan so that studying for the exams becomes part of your work routine instead of being counterproductive and disruptive to your schedule.

8. Have fun – While learning and carrying out open-ended research requires dedication and hard work, it should not be dull and lonesome. You are encouraged to socialize with your friends, fellow students, and faculty in and outside of Chemical Engineering. It is important to continue to make progress in research, but also to enjoy this unique learning experience and maintain a balanced, happy life!

You will likely also have expectations of me. Do not be shy about letting me know what these are!