

Mathematical instruction should foster students' abilities to think clearly, communicate with precision, and investigate their own areas of doubt. One of my main responsibilities as an instructor is to highlight key material and provide a roadmap to students in their exploration of the field. While many of my goals and techniques overlap for undergraduate and graduate students, I do emphasize different takeaways; for undergraduate students, I aim for students to understand the main results, understand how they fit into the broader field, and be able to apply them in courses going forward. For graduate students who may be more self-directed, my goal is to provide them with a sufficient overview of the literature and introduction to relevant techniques such that they have enough preparation to read current papers and learn on their own going forward.

While presenting my students with new material and novel ways of analyzing problems, I strive to present a balance of material for the students to absorb, and materials for the student to create. In lectures that I have given, I structure the flow around presenting clear takeaways and giving the students a chance to explore amongst themselves. I begin each class with an outline of what we will cover. I find that this is helpful for students to be able to get in the right mindset for the course and for those who take detailed notes to be able to organize themselves. It also contributes to the roadmap that I provide as an instructor – when students look back at this lecture, I want them to be able to remember the key topics covered, both for their own reference and for their broader understanding of how the course fits together. As a student myself, I am often overwhelmed by professors who move quickly during lecture and use the white board to write only occasional notes – when I lecture, I make sure to do simple things like put boxes around key results and enumerate the steps we took to get there. I make sure that the board is organized and legible and pause frequently to allow students to catch up and ask questions. I have found that, based on the backgrounds and learning styles of students in the course, it can take less experienced students longer to internalize the material, and moving too quickly can both alienate them and hinder their ability to understand the rest of the material. I use group exercises as a way to break up the lectures, give students a chance to experiment with the material and learn from each other, and provide students who may be shy with a chance to ask me or their peers questions more subtly.

I assess the learning goals at multiple levels throughout the course, in some ways explicit, and in other ways purely for calibration purposes. For example, when lecturing, I can get a quick check on student engagement simply from their facial expressions and posture. When giving recitation sections, I tell them my plan at the beginning of the section and then ask students for what they would like to cover – I write down their requests in a list on the board and make sure to address any broader themes. My in-class group exercises give me a chance to coarsely assess understanding as well. I believe that homework assignments should incorporate group work and individual work, both in the theory-based and application-based aspects of the course. Group work gives students a chance to share ideas and perspectives, but it can also be imbalanced if certain students are more advanced or assertive than others. Therefore, I prefer to have most of the grades based on individually produced work, with properly cited help allowed from teaching assistants and other students. I know how easy it is to become overwhelmed as a student, and exactly for that reason, I keep hard deadlines. I find deadlines to be an excellent way for students to plan and pace themselves, so I announce deadlines well in advance and drop the lowest grade on an assignment in case of emergencies. I believe in frequent small exams in the form of quizzes along with several larger evaluations at the middle and end of the semester. These can be written exams for theory courses, project-based exams for application courses, or literature reviews for graduate seminars.

Throughout this, although my role as a teacher is not explicitly one of a mentor, I believe the two to be inseparable. As a female student, I placed incredible value on competent, supportive, and inspirational female instructors. My teachers had a strong impact on the key results I learned, my thought processes when solving problems, and my own confidence to expand my learning going forward. I acknowledge the gravity of this responsibility and embrace the immense opportunity to inspire and nurture students at any level of learning.