

Teaching statement

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The most important reason for me to receive superb teaching evaluations (publicly available on [my webpage](#)) and the TA Excellence Award is probably my course notes. Whenever my schedule allows, I will always try to organize the stuff I have talked about in class into PDF notes, then share it through my website. Sometimes I would teach on iPad directly. So the organization won't take too much time after class. There are tons of benefits for doing this:

1. Students won't be worried if they miss anything. Instead of spending all the time in the class busy copying my board work, they can focus on thinking about the problems and the discussions. Some students would still take notes anyway. But they won't be worried if they have to stop and skip some parts, as official notes will complete the gap.
2. I also won't be worried if I miss anything. I usually prepare much more than I can talk about in class. And students in different sections ask different questions. The notes also made it possible for me to focus on engaging the students and understanding their problems. Making sure the students have a clear understanding of one problem in class is much more important than covering everything. And the notes take care of the rest.
3. Whenever some student had to miss a class, they can study from the course notes. So when they come to the office hours and ask for help, all I have to do is to pull out the course notes and go over it at a rapid pace, to see where the students are having trouble. It saves both my time and the student's time.
4. The philosophy of the notes is to provide supplementary materials to the textbook. For the ODE course, the textbook is way too wordy. So my notes are concise, only mentioning the most important parts. With these organized notes, I am capable of reviewing the materials covered in two weeks in just 15 minutes. For the Analysis course, the book I chose was not elaborate enough to avoid confusion, so my course notes will be much more elaborate.
5. When I am teaching the same course again, the notes in the past become a valuable resource. I would ask myself a series of questions: Is the explanation clear enough? Is there any important detail missing? Are there easier approaches? Are the examples well chosen? Are there better examples? Is it possible to achieve the same with less steps and less time? So there will be solid improvements.
6. For students who had trouble in the prerequisite knowledge of the course, their weakness will be exposed by a surveillance quiz held at the beginning of the class. For each point of weakness, supplementary exercises that take usually no more than two hours are provided. I will urge them to finish these exercises as soon as possible. Usually, students have to take five classes in a 14-week semester. So after the first midterm, their study on my course will frequently be interrupted by the midterms from the other courses, and thus it will be difficult for them to do any extra work.

Aside from these efforts in teaching, I also strive to establish an effective communication system to my students. Although in theory students can always email the professor any time, in practice they might be too shy or embarrassed to admit that they couldn't figure the problem by themselves. They need encouragement and a feeling of safety to start doing so. Here is what I would do:

1. When I finish the explanation of a problem, I would say “30 seconds for questions.” And I do wait for 30 seconds for the students to respond. This pause allows enough time for students to look at the board work and review the whole process. As I have observed, a lot of questions were asked within the last 5 seconds.
2. No matter how silly the question looks like, I would still answer it. Although some other students might feel bored, this is a necessary cost for the questioner not to feel discouraged. Of course, in case the question needs too much time to explain, I would say that the time is limited and the problem will be addressed in the notes.
3. In case some students are missing classes or missing an assignment, it would just take a minute to send a brief email saying “I didn’t see you today, what happened?” Such messages proved to be the most efficient way to know what is going on.
4. It is important to make sure struggling students not to feel being left behind. Controlling the pace of exposition, frequently recalling the prerequisite knowledge and asking struggling students to answer an easy question will help them to focus on the class and grow confidence.
5. It is also important to make sure top students not to feel bored. My trick is to include something that is very unlikely for them to get from self-studying. For example, when teaching upper and lower limits, I would briefly mention the conjecture $\liminf_{n \rightarrow \infty} n^2 |\sin n| = 0$ and its relation to number theory (how irrational is π). Also, challenging problems will usually be provided during the class. So even if they don’t want to pay attention when I am explaining an easy question, there is something for them to work on.

When it comes to assign the grades for homework, quizzes and midterms, I would strictly stick to the academic standard, not making any compromise. If someone writes $\ln(\mu) = -\ln(x) \Rightarrow \mu = -x$, then he or she receive absolutely no partial credits, no matter how other parts are done. Aside from such harsh grading policy, I would also do the following to compensate:

1. Overdue homework is always collected and graded, but with a 20% of the late penalty. Comparing to rejecting their late work and thus they do nothing, I would rather they get some practice anyway.
2. Ample time will be left for the quizzes at the end of each class. I would walk around to check their work. If someone doesn’t know how to start, I would give a hint. If they are submitting the quizzes with mistakes, I would point out the errors and ask them to redo it, whenever there is time left.
3. When I am the instructor, I always offer a second chance for the quizzes and midterms. People not doing well in a midterm can get their grades exonerated by doing some extra work. If I am convinced that the student has made significant improvement, I will not count the midterm in the final grading computation.

I firmly believe the following: Mathematics belongs not to the mathematicians, but to all mankind. The advance of mathematics is not marked by achievements of individual mathematicians, but by the understanding of the whole mathematical society. Mathematicians are responsible not only for discovering new mathematics, but also for explaining mathematics to whoever needs it. Therefore, teaching duties, together with the annoyance they brings when they are interrupting my research progress, are just part of my life as a mathematician that I am enjoying.