

Random Thoughts and Some Teaching Techniques that have worked for me – Dr. Loveless

1. **I try to do everything with a purpose in mind and I try to make that purpose very clear to students in my classes.** Every day of class, I say or write down the goal for the day at the beginning of class and I also try to give each idea as much motivation as possible. I think it is important to help students organize the material and giving them goals and outlines of your plan can really help students. Don't just do something to waste time or wake them up, if you have them do a problem in class, pick a problem that pushes the lecture along or clears up a piece of the key concept.
2. **I like to think about what I want the students to know at the end of the term. Except for Math 300, these are ALL service courses (111, 120, 124/5/6, 307/8/9, and 324).** That means a large number of students in your class are NOT math majors. They are intending to go into a science or engineer or computer majors that requires they know the basic tools of our courses. So you need the students to know all the material laid out in the departmental syllabus so they can go on to do the things they need to do in their applied major. Because of this, I tend to teach these course in an applied/example driven way with fewer proofs. I do proofs when they aren't going to take long and when they help illuminate the material, but, otherwise, I primarily teach by examples in these courses. That all being said, **I do like to think about what the biggest concepts are for the course and what main problems I expect them to be able to solve by the end of the term.**
3. **Every Friday, I make a plan for the following week** which includes:
 - a) I decide on homework assignments, quiz sections assignments, and coverage of material for the next week.
 - b) I email my TA's and graders with the plan for the next week.
 - c) I email all my students every Friday. In that email, I remind them of the schedule, I point them to examples of good problems in the exam archive, and I give them general advice about studying and doing well in the course.
4. **The day before each lecture day, I finalize my lecture notes** as follows:
 - a) I spend about 20 minutes to an hour digging into the material for that lecture as follows:

I read through the section of material. I work through a few homework problems. I look at example problem from previous instructors, review material, other books or old exams.
 - b) Then I write my own lecture notes. Most of my lectures look something like this:
 - i) An entry task or some motivational example at the beginning. When I do an entry task, I have the class work on a problem for about 5 minutes while I wander around class. Then we do the problem together as a class on the board (this takes about 10-15 minutes today).
 - ii) After motivation, I typically spend 15-20 minutes discussing the concept for the day. I try to get the class involved wherever possible (I often say things like "what should I write next?", "what questions do you have about this?", "I just intentionally made an error, can you spot it?").
 - iii) Then I typically do example problems that are like the homework or like old exams. Typically I do one problem myself. Then I do a problem where they help me give the solution (I ask them to work out the first step on their own, then we do it together).

A given section never fits this model perfectly, sometimes there is too much to cover in a day, so I don't do the entry task or I can't do many examples (but I still usually say a few words of motivation and I still always lay out how to approach problems).

5. **Before the quarter starts, I scan through all the materials and work through a few old finals and midterms.** In this way, I get a good feel for the overall goal of the course. I feel like it is good to have a rough idea about the content of the exams before I start teaching a course. I also try to talk to two or three previous course instructors.
6. **I search for examples of course calendars and homework assignments for previous quarters.** It is nice to have these for reference as you create your own calendars and assignments.
7. Other that I think about:
 - a) **Try to make your lecture tell a clear story** (what is the main concept, what are they trying to do, etc...)
 - b) **You should think about what is the most important thing for them to know for that day.** What is the most important thing for them to remember when they leave class that day?
 - c) Also, help them **identify the side (algebra, calculus) skills** they need for a given section. Perhaps give a brief refresher (sometimes I do these skills as entry tasks)
8. **At the beginning of class, I always put reminders on the board and I say a few comments and bits of advice about the course.** I remind them about office hours and I remind them about due dates. I also give advice about what how far they should be with the material and I give advice about studying.
9. **I like to show up to my class 20-30 minutes early. I typically find a good spot outside my classroom (or near my classroom) where I can chat with students during this time. I call these my unofficial office hours.** This works well to answer quick questions and it also gives me a good chance to find out what is confusing my students. And if students ask good questions during this time or if there is an obvious confusion, then I can make a quick announcement at the beginning of lecture.
10. **I like to make weekly review sheets that I post.** These are just a very compact version of what we did in class that week. It helps me organize the materials in my mind and students seem to like the organization as well.
11. **When you have only one small class, I would advise you to hold an extra review sessions before each exam** (perhaps use the room next to the math study center). This is not necessary, but I think you will find that your students will respond better to you in class after these review session. Holding an extra review session is a good way to get to know them and students really appreciate the extra time. This is not always feasible depending on your schedule or the number of classes you are teaching/taking. But you can still label one of your office hours as a supplemental review session.
12. **After each exam, I email out detailed information about the grades.** I try to anticipate as many questions as I can (students always have questions about grades after exams and if you can get some of those questions answer ahead of time it makes your life easier). If you want to see some of things I say, check out my most recent gradescale here: <http://www.math.washington.edu/~aloveles/Math307Spring2015/gradescale.html>