

TEACHING STATEMENT

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During my time as L.E. Dickson instructor at University of Chicago and before that, as a graduate student at Berkeley, I have taught the following courses:

- A sequence of courses titled “Analysis in \mathbb{R}^n ”, (part I, II and III) during Autumn, Winter and Spring of 2006-2007 and again in 2007-2008. These courses were mainly for second year undergraduates, a large number of them being Economics majors.
- A course in “Algebraic number theory” during the spring of 2007. This was mainly aimed at mathematics majors in their fourth year.
- A course titled “multi-variable calculus” and a course titled “Linear algebra and differential equations”, during the summers of 2005 and 2006, in the summer session at Berkeley.

Other than that, I worked as teaching assistant for various undergraduate courses at Berkeley for six semesters. Teaching these classes have been a truly rewarding experience. I would like to summarize my outlook towards teaching that I have developed during these years of experience.

Prepare in advance. I always plan my lectures in detail and solve the problems ahead of time, however easy the material is. Otherwise, little innocent confusions about sign convention and such, other than losing useful minutes, can make one lose a large part of one’s audience. Working through the material in my own way before the lecture helps a lot to better emphasize the key ideas in a proof. It also lets me pay more attention to the students questions rather than trying to think of what to say next. Advance preparation also helps to provide the “big picture” once in a while, which is essential for keeping the students interest alive, because one can easily lose sight of the woods for the trees.

Understand your audience. The algebraic number theory class that I taught mostly consisted of students who were about to start graduate school in mathematics. They were already highly motivated so I could just talk to them as fellow mathematicians. I had great response from them just by sharing the beauty of the material. I had a similar response from the audience in an expository talk I gave this year in the Chicago summer mathematics program for bright undergraduates.

On the other hand, in the first and second year calculus classes, I try to be a lot more nurturing. In these classes, usually I interact with a group of very bright young people. But they are not mathematicians and they have varied interests and backgrounds. However I have found that, if one takes the trouble to come down to their level and make an honest effort to explain things clearly they do really appreciate it.

Strike a balance. I try very hard to make sure everyone’s interest is attended to. I do not want the brightest few in class to feel bored, so I sometime give them a couple of extra

problems to work on, while I try my best to make sure that I am not leaving anyone behind. The extra hours in office hour also help a lot in this regard, I can give more attention to the fundamentals for people who need to strengthen their basics while I can tell the more advanced students about what lies ahead.

Listen to the student's questions. There are no stupid questions, only stupid answers - is what I keep telling my students. The students first encounter serious mathematical proofs in the analysis courses. They are new to the language of mathematical logic. Often the questions they pose are incoherent, which is normal when one is speaking a new tongue and is confused. I am very careful not to kill the discussion by presenting a perfect solution to the problem immediately. Rather I encourage them to define some of the terms involved in the problem or draw attention to a related example that we have seen in class. This gets them talking and often brings out the source of confusion.

Encourage discussions. One can only learn mathematics by actively thinking about it and solving problems by oneself. In the problem sessions I try not to dish out ready-made solutions but rather help students finding them. I feel this way students learn best.

Even when I am solving a problem in class, I usually ask for inputs from the students. It is amazing, if one is willing to wait a bit and prod a little in the right direction, how often the students have the right idea, but merely lack the words to put it in. By asking the relevant questions one can fill that in, and make them realize what they already knew. It boosts their confidence greatly.

Be approachable. To be able to engage in a discussion of the kind I described just now, one has to be approachable and sincerely concerned. For starters, I try to learn the students names quickly. Handing out the quizzes and homeworks individually helps in this.

Usually if a question is put in front of the class only a couple of students seem to answer every time. By addressing the students individually, I can make the whole class talk and make sure that the silent ones do not feel left out. Though I am usually very punctilious, to err is human. I readily acknowledge any mistake on my part and clearly explain what I failed to notice or where the pitfall was. I think accepting one's mistakes makes the students feel more relaxed and they feel less intimidated to speak out for the fear of saying something wrong. I always strive to make the class as interactive as possible.

Share the fun. Finally it is very important to keep the atmosphere alive by putting in the occasional jokes and anecdotes relevant to the material. I also try my best to point out the beauty in the material as I perceive it. Teaching lets me relive the thrill that I had experienced when I first came across $e^{i\theta} = \cos \theta + i \sin \theta$ or Cantor's diagonalization argument. To see the students face light up in the same excitement, has been one of the great rewards of teaching to me. I believe that if I can open a few eyes towards the beauty of mathematics, and the students can go beyond memorizing formulas for the sake of grades, to the stage where they do mathematics for the same pleasure that I get out of it, my job has been well done. I love to teach and I think it would not be an overstatement to say that I have been often successful in achieving that aim.