TEACHING STATEMENT

SERBAN M. COSTEA

1. TEACHING EXPERIENCE

As a graduate student, I have taught mathematics to students at various levels. In Romania I covered the recitation sections for Numerical Analysis at the West University in Timisoara for three semesters, between February 1998 and May 1999. In the United States I began my teaching experience in the Autumn 1999 quarter at the Ohio State University, where I covered the recitation sections for courses in Calculus I and Calculus II. While there, I was also given the opportunity to teach an individual section of Calculus II in the Summer 2000 quarter. During that quarter, in addition to covering the recitation section, I wrote and graded the exams myself.

At the University of Michigan, between 2001 and 2005, I led sections of Precalculus and Calculus. Typically, the student body in these courses consists of freshmen and sophomores with different kinds of background that are fulfilling math requirements. Graduate students at the University of Michigan are responsible for their own class. I was responsible for giving and preparing lectures, assigning and grading homework, holding regular office hours and spending time in the mathematics tutorial lab. In addition to the aforementioned responsibilities, I wrote and graded the exams in the Spring 2005 semester when I taught Calculus I. The course structure allowed me to use a number of different pedagogical techniques, including traditional lecturing, problem solving sessions, cooperative learning, and calculator experimentation.

As a postdoc at McMaster University, I had the opportunity to teach Partial Differential Equations (Winter 2009 semester), Calculus III (Spring/Summer 2009 and Fall 2009 semester) and Applied Mathematics II (Winter 2010 semester), which is a course offered to graduate students. In these courses at McMaster I had full responsibility for giving and preparing exams, lectures, homework assignments and quizzes, as well as for grading exams and quizzes. I also held office hours for all these courses taught at McMaster.

As a postdoc at EPFL in the Fall 2010 and Winter 2011 semesters I supervised and co-ordinated a group of 12 tutors for the Analysis I and II courses and I also helped with the implementation of the group work policies for these courses. In the Winter 2012 semester I was an assistant for the Geometry course at EPFL. I also graded the final exams in all these courses. The experience I gained at the University of Michigan has proved very helpful in implementing group work policies and in coaching tutors at EPFL.

2. TEACHING PHILOSOPHY

A primary goal of my teaching has always been to deliver easily understandable lectures. As teachers, we must synthesize our broad grasp of the field into a rational and approachable form. Mathematics, after all, can be difficult to understand in its most axiomatic form and students often seem uninspired or even scared by abstract notions. That's why I present to them many problems and examples. If the students see many solved examples and problems that use the theoretical concepts, they feel more confident with the material and are more willing to learn it.

A challenge of teaching mathematics is that of seeking involvement from students. Therefore, when teaching, I always encourage them to take an active role in the learning process. I stop frequently to interact with the students, I welcome their questions, and I also ask them for

insights. The students have to engage themselves in order to learn how to think mathematically or in order to learn the material.

In all the precalculus and calculus classes that I taught at the University of Michigan I emphasized working on problems and working in small groups. While having students doing problems in groups, I would circulate in class from one group to another to check on their progress and to help them out. I would make them explain their reasoning, help them discover their errors and guide them to the right answer. Sometimes I have one student presenting the solution to the whole class. Working together, students will correct each other, challenge each other and teach each other, which to them is like having additional instructors. Also, when one student has to explain to other students his solution to a problem, there is an obvious benefit gained by having to do that. By teaching others they reinforce their own understanding. Moreover, the expository skills that they gain by explaining a technical subject will serve them later in whichever field they pursue. It is worth mentioning that such interactions help the students get more comfortable with one another and with me. Group work prepares them for real life, because many of them will end up having jobs where they will have to work in teams.

In order to see how well students understand the concepts taught in the previous lessons, I test them often by giving them quizzes and/or homework assignments on a regular basis. I often discover that a large portion of the class has difficulties with a specific problem. Whenever this happens, I review the problem, asking them what they specifically found difficult about it. I address their specific difficulties while trying to explain the main idea conveyed by that problem.

In my opinion, a good mathematics professor should love one's field and show this when teaching. Enthusiasm is very contagious and so is the lack of it. It is crucial to maintain the students' interest, and while personal interaction may be difficult in a large lecture course, the students must nonetheless be challenged frequently.

In short, giving clear, accessible lectures is very important in my teaching but so are the interactions between students in classroom, in group work sessions and office hours.

I will finish by saying that I have found teaching math to students very rewarding. The satisfaction of seeing them understand the concepts and solve challenging problems was well worth the effort.