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Winter 2008 Teaching Skills Study Award-Summary of Learnings
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Mathematics

Overall this meeting offered a very wide variety of talks about teaching mathematics at the undergraduate level. I attended 4 full days of these and learned about research on the effectiveness of quizzes versus homework in class, efficient ways to give students useful feedback on their written assignments and new innovative programs in other universities to put mathematics education majors in the role of mathematicians as a way to motivate them and give them a hands on approach of the discipline they will be teaching in secondary schools.

I also attended a variety of talks on teaching specific mathematical subjects in the classroom. One of these subjects, exposed the research a group of professors is conducting in their undergraduate class that lets mathematics majors transition from the computational mathematics to the proof classes. These professors are using the “Modified Moore Method” which lets student truly discover proofs by themselves. The professor’s role in this class is more of a facilitator/consultant than a lecturer. The professor writes a series of well thought out and structured definitions and axioms followed by a series of carefully chosen questions that will make students deepen their knowledge and discover patterns and therefore proofs.

Finally, I attended a series of mini-courses:

Using GeoGebra to create activities and applets for visualization and exploration.

The advantage of this software over others I have been using before is that this one is free. Therefore, students with financial limitations have full access to all the benefits without jeopardizing their budget. This software allows student to program the computer to let them see geometry in motion. They can construct and see why all the theorems that we have proved true in class actually work.

Directing undergraduate research.

This mini-course explained different approaches to directing undergraduate research and the pros and cons of each of them. They also provided us with a wide variety of sources of problems that will be challenging and that will motivate and inspire students to keep learning in the future. This mini-course have proven to be extremely useful over 2009 as I have directed 3 different independent study classes.

An introduction to the mathematics of modern cryptography, as well as a series of two sessions on Mathematics of Games and Puzzles.

This mini-course focused on modern mathematics that offers fun problems that would also reinforce the idea of applicability of the subject. In particular, modern cryptography which relates to the mathematics underlying online registration to classes, for example, or the mathematics behind paying bills or shopping through internet.