The study of mathematics enhances vital critical thinking skills required to efficiently identify and solve problems encountered in any profession. Unfortunately, many individuals place little value on learning math beyond basic algebra because it lacks direct application. As a college professor, I strive to expand the vision of my students and help them recognize the true advantages of learning deeper intricacies surrounding advanced mathematical theory. I earned a doctorate from the University of Virginia in May 2013, and during my graduate career I had the opportunity to teach a variety of mathematics courses as a primary instructor. The resulting experience further emboldened my beliefs about mathematics, and I felt encouraged to pursue a career as a college educator. I subsequently immersed myself into the liberal arts environment as a visiting assistant professor at Lafayette College. My teaching philosophies are based on my experiences as a student, discussions with colleagues, and teaching the following courses.

*LC MATH 263: Calculus III- Lecturer Fall 2013*
The third course in the calculus sequence. Topics include vector calculus, partial derivatives, gradients and directional derivatives, tangent planes, multiple integrals and line integrals.

*LC MATH 141: Diff Calculus and Econ Modeling- Lecturer Fall 2013*
A course in the differential calculus of one and several variables intended for students who plan to major in Economics or Policy Studies.

*UVA MATH 1210: Applied Calculus I- Lecturer Fall 2009, Fall 2010*
A first course in calculus recommended for business, biology and social science students.

*UVA MATH 1220: Applied Calculus II- Lecturer Spr 2010 and 2011, Fall 2012, Sum 2013*
A continuation of MATH 1210. Topics include integration techniques, functions of several variables, and series.

*UVA MATH 1310: Calculus I- Lecturer Fall 2011*
An introductory calculus course recommended for natural science majors and students planning on additional work in mathematics.

*UVA MATH 1320: Calculus II- Lecturer Spring 2012*
This is a continuation of MATH 1310. Topics include techniques of integration, series, polar coordinates and double integrals.

For young students mathematics provides an excellent opportunity to enhance critical thinking skills since it requires them to reason through difficult logic problems. However, in order for students to succeed in solving these problems they must first understand the material presented. Thus, my teaching ideology focuses on developing problem-solving skills by combining an interactive, structured lecture with numerous mathematical exercises.

Clear and engaging lectures build a strong foundation upon which students can develop their knowledge of mathematics and critical thinking abilities. Hence, my board work consists of organized notes complete with examples that complement the concepts and showcase valuable problem-solving techniques. Further, to keep students engaged during class I maintain an energetic atmosphere, encourage class participation, and vehemently convey my passion for mathematics. Students respond favorably to my class demeanor. For instance, on an evaluation from my Spring 2012 Calculus 2 course a student wrote, “Kristen is a wonderful
instructor. Her many examples, love of questions, and enthusiasm for the material make a very challenging class into an enjoyable experience.”

In addition to a well-organized and alluring lecture, a successful math course consists of in class exercises that require students to act instead of just listen. For example, in lieu of presenting a difficult problem on the board I will give my students a worksheet that guides them towards the correct solution. Such activities mesh nicely with lecture because they keep students focused during class and create an encouraging environment in which students can grasp new ideas. Students appreciate these activities. On the course evaluation for my Fall 2012 Applied Calculus 2 class 88% of the students stated that their weekly in class worksheets were beneficial.

Finally, students truly improve their problem-solving skills by working through mathematical exercises. Thus, I require my students to complete a wide array of homework problems each week. They start with straightforward computational problems that are meant to reinforce their understanding of the material. Then they move towards difficult and thought-provoking problems such as “Prove, using the Intermediate Value Theorem, that $\sqrt{2}$ exists.” This type of problem improves students’ reasoning and logic skills by challenging them to combine several mathematical concepts into a single, coherent solution. Students generally agree that these problems are helpful. On my course evaluation from an Applied Calculus 2 class, 87% of my students admitted to benefitting from them, and one student commented, “I think the problem sets helped me gain a deeper understanding of the principles learned, and they made me think outside the box.”

In taking my class my students both grow intellectually and develop an appreciation for college mathematics. I am always proud of the progress they make. However, I am always trying to improve as a teacher and would love to explore different types of in class activities. For example, in certain classes I would like to have students explore concepts via mathematica and have them present projects on topics related to the course. I look forward to discussing such activities with my future colleagues and hope to learn about some new enterprises from them!

Furthermore, I would like the opportunity to teach a wide variety of undergraduate courses. As an algebraic topologist, I dream of teaching courses in both abstract algebra and topology. However, I would also like to teach a basic real analysis class and a proof-writing course in which students learn to use Latex. I am also interested in teaching a course on the history of mathematics and a course exploring the mathematics of games and puzzles.

Finally, I am excited to immerse myself into the academic environment. I would love to mentor undergraduate research projects such as a senior thesis or summer research program. I would also like to work with the math club and participate in other math activities. Further, it is important to be an active member of the greater liberal arts college community, and thus I see myself building and coaching club ultimate frisbee. A liberal arts college is an ideal place for me to do all of these things and grow as a teacher, scholar, and mathematician.