

Michael A. Diehl

Teaching Statement

22 High Street
Unit 2
Amherst, MA 01002

413-687-1893
diehl@math.umass.edu
www.math.umass.edu/~diehl

Education has been a part of my life for as long as I can remember. Not just because I've been a student every year of my life since I was five, but because I have known for a long time that education is my calling. Part of what has inspired this choice is a rich collection of teachers that have educated me at all levels throughout my life. Following in their footsteps, I became a math education major in college. Although I left the education program to add a second major in computer science, my commitment to teaching was still strong. I went on to become the school's head math tutor, and an undergrad TA in the classroom. Then graduate school afforded me the opportunity to not only satiate my hunger for more math, but to teach my own classes at the college level. Throughout all of these experiences, my love for teaching has only increased, and I have developed a highly successful teaching philosophy.

During my four and a half years at UMASS, I've taught eight courses, and assisted on seven others. These included the usual basic statistics and calculus courses, but I was also fortunate to be selected to teach my own sections of more advanced courses, like multivariable calculus and ordinary differential equations. In some of these courses, I was able to develop my own syllabi, write my own exams and design exciting and challenging problems for homework and group work.

In the classroom, my students have reacted positively to my teaching style. I meticulously organize my lecture notes to avoid wasting time and to reinforce my mastery of the material. I exude enthusiasm when teaching, as is evident by evaluations I receive where students regularly make fun of my "talking with my hands" habit at the board. I write practically everything I say on the board, since I know this is the only way to get students to copy it down. I stop frequently to ask for questions, and even if I don't get any, my "they're totally lost" alarm sometimes goes off, and I'll backtrack to redo something. After presenting a concept and doing a simple example problem, I'll usually give the students a more difficult problem to work on individually or in groups. Then, either a student or I will present the

problem to the class, explaining it in great detail. This keeps the better students interested by challenging them and it allows the students to learn how to help each other, while making sure everyone is on the same page. At the end of each lecture, or at the start of the following lecture, I give a brief recap to highlight the major ideas that they should have gotten out of the material presented. I find this helps organizationally-challenged students sort through what might seem like a colossal mess of notes. Overall, I keep the classroom atmosphere light and friendly to make the students feel comfortable asking me questions in class and during office hours. My all-time favorite comment that I received from a student is: “I like totally thought this class would be like totally horrible, just like all the other math courses I’ve taken, but like it wasn’t totally awful...it was actually like kinda fun.” Bad English aside, it speaks to the success of my teaching style.

The driving force behind my teaching style is my teaching philosophy, which can be summarized in two steps: clarity then creativity. The first step towards learning anything is to have a crystal clear understanding of background and rudimentary concepts. I try to rely on past experiences to identify potential background deficiencies, and work some necessary review into the lectures. For example, when I teach differential equations, there is always a quiz in the second week of the course on properties of the natural log since I’ve seen my share of students fumbling with this basic issue throughout the course. I feel it’s of the utmost importance to take extra care in driving home the basic concepts that are taught at the beginning of each course. Since most math courses are cumulative, losing students early on should be a major concern. I lessen this problem by including a lot of repetition in early lectures and assignments, and periodic quizzes leading up to the first exam force students to rigorously study this introductory material. I also vigorously encourage students to come see me for help before they fall too far behind.

With a solid foundation in place, I believe we must challenge our students to think with independence and creativity. Exams are essential for assessment, but don’t generally allow students the ability to think outside the box. However, this type of thinking should be a standard part of any course. On a small scale, I do this by assigning word problems, which offer the student a taste at how mathematical concepts are applied to actual problems. I also

like to have students work in groups during class so that they can get a different perspective from a classmate on how to do problems. On a larger scale, group or individual projects are a great way to tie a series of concepts together, while allowing students to express their personal voices and developing their abilities to think critically. When I teach an introductory statistics course, I usually offer students some extra credit if they write up a report discussing the Monty Hall problem. Even with just one semester of statistics under their belts, I'm always amazed at the quality and insight that they give in their reports. I can see their enthusiasm as they usually comment how they expected the answer to be one thing, but were fascinated to do the calculations and find that it's the opposite answer that's true. Generating this kind of excitement in the classroom inspires students to continue studying math, perhaps even in the form of a faculty-directed research project.

Another source of classroom creativity comes from using technology to supplement instruction. Properly used, technology in the classroom helps clarify material through the visualization of concepts, and it can generate excitement in our tech-savvy students. Of course, one needs to be sure that technologies are used to support instruction, not replace it. In a first semester calculus course, after teaching students the calculus needed to solve optimization problems, I like to use the calculator to show students how to graph functions to demonstrate that we can visually confirm our max/min and concavity solutions just by looking at the graph. I encourage them to use their calculators to back up their solutions on assignments, but on an exam, I insist that they know how to solve the question mathematically, so they do not become dependent on their calculators. Similarly, in differential equations, I use technology to graph slope fields to reinforce the central concept that a differential equation for a function paints the picture for what the actual function looks like. However, I don't allow calculators on an exam so that students need to do integration by hand, rather than relying on the symbolic integration features that newer calculators have. Outside the classroom, I support the online homework system that UMASS uses, where students complete problems online, and are given feedback and hints if they get stuck. I also utilize a well-maintained course website as an important channel of communication between me and my students. I am enthusiastically looking forward to bringing the innovative teaching technologies of the future into my classroom.

To be truly successful, a teaching philosophy must be dynamic. Each course and each classroom of students is unique, and educators need to be ready to make on-the-spot changes to be their most effective. Although I'll enter the classroom with the philosophy presented above, I always keep my finger on the pulse of the class to ensure that I'm doing all I can to help my students learn. Grading weekly assignments and asking for student suggestions during the semester gives me the feedback I need to make any necessary adjustments. My experience has allowed me to form a successful teaching philosophy, and my desire to constantly update it will ensure its success in the future.