

# Statement of Teaching Philosophy

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Teaching has been my passion for as long as I can remember. It began when I was in middle school, tutoring students in advanced algebra. After tutoring through most of high school, teaching two adult computer education classes, and TAing for three years as an undergraduate, I knew I wanted teaching to be an important part of my life. The joy of mentoring students, helping them gain a firm foundation in a topic, and assisting as they build from that base, is incomparable.

As a teacher, my goal is to help students truly understand the subject matter by igniting their desire to learn, encouraging them to think deeply about the core concepts of the class, and finding ways to make the material relevant to their world. A successful teacher must possess good teaching skills, including a passion for learning and a desire to share that passion with others. I have also learned through personal experience that not everyone learns the same way, making the ability to innovate another crucial asset for a good teacher. Over the course of my undergraduate and graduate teaching and research career, I have discovered that I possess these qualities.

Most of my teaching experience comes from teaching an introductory class at the University of Virginia last fall, as well as from TAing at the undergraduate and graduate levels. My class, Introduction to Information Technology, is a class designed for non-computer science majors to provide exposure to a very broad spectrum of topics. These topics include important areas of information technology such as web design, basic programming, technical ethics, and proficiency in modern tools. Most students came in expecting an easy A and perhaps to learn some advanced functions in Excel. My goals for the class, however, were to teach them how to learn about the technology they were using and to start to think about other ways technology can be used. As technology changes, they will need to change with it.

As the course instructor, I learned how to develop new curricula, write stimulating assignments, design fair tests, and evaluate and reflect on a course and its execution in order to improve it in the future. When I prepare to teach a class, I often remember a quote from John Gardner who said, "Much education today is monumentally ineffective. All too often we are giving young people cut flowers when we should be teaching them to grow their own plants." One of my principle goals is to provide the students with a firm foundation from which to grow.

Instead of simply covering the material, I use history, examples, and analogies to drive lessons home. For example, when teaching about multicore processors and how they work, I begin with an analogy of two chefs working together on different counters to create a single dish that sits between them. Both work in parallel for certain tasks, but certain bowls or ingredients may be shared, and the chefs need to communicate well to gradually create a final plate. When teaching about network protocols, I had the class discuss different methods and challenges of trying to mail a large document across the country efficiently and effectively.

For other topics, I used examples, both historic and recent, to demonstrate the basics. When teaching an introduction to digital audio, for example, I showed the students YouTube videos of Delia Derbyshire, a woman who pioneered electronic music composition and is best known for her electronic realization of the theme music of Doctor Who, a popular science fiction series. When discussing malware and hacking, I created examples using simple scripts that they could easily understand from earlier course work that would log and track browser information. Through these examples, the interest of the students was peaked, and the lessons became much more exciting.

The students in my class were from many different backgrounds and experience levels, and I strove to teach the class in a way to enable students of all abilities to obtain something unique from their learning experience. Students who were ready to learn the higher-level messages could do so. Others learned the basics as intended. Throughout the course, I evaluated my approaches by posting surveys and polls regarding the exams,

homework assignments, quizzes, and class structure, and I learned much from the students' feedback. As the course progressed, I customized my techniques and began giving more hands-on examples and thought-provoking quizzes. This provided students, especially those interested in particular topics, bridges to other areas to explore.

The success of my teaching approaches especially could be seen from the final project submissions, as well as the final course feedback. Many students went above and beyond the project requirements, exploring things related to, but not covered in, the class. In my final course feedback, I received many positive comments such as "I do feel more prepared to use information technology in the business world because of her," "I progressively learned more each week and appreciate your dedication and patience with all of us!" and "I really wanted to major in Computer Science before. This class let me know I was making the right decision!" Another student remarked that they "found a lot of the material to be useful in several other areas outside of the course."

In motivating others to learn about topics in computer science, a good teacher should also encourage students to take their knowledge to the next level. Undergraduate research can make the concepts that students learn in their computer science classes more concrete and fascinating than any homework or exam, and it is important to me that undergraduate students become involved in research.

I have been committed to promoting research throughout undergraduate and graduate school, both in and out of the classroom. As an undergraduate at Allegheny College, I served as the ACM Student Chair for two years, and I put much of my effort into introducing students to different areas of study in computer science. In graduate school, I also served as the ACM-W Secretary. As the ACM student chair, I organized weekly lunch-and-learn meetings in which we discussed different papers or articles from ACM publications. I also leveraged the ACM Distinguished Lectureship Program to bring 14 speakers to Allegheny College, each presenting a different area of interest. In both groups, I helped to organize events that encouraged students to interact with their fellow students and professors within the computer science program and to learn from leaders in the discipline.

I have also engaged in mentoring students and working collaboratively on projects with them outside of the classroom. As one example, I acted as a mentor to an undergraduate at the University of Virginia who was just beginning to explore research in computer science. We worked together for a year on regression test suite prioritization techniques, and our research resulted in a workshop paper. She then went on to graduate school and is pursuing a PhD.

Even in an introductory course for non-computer science majors, I discussed possible projects and research ideas with several students. In the first weeks of my course, a student approached me with a research idea in the area of digital music and machine learning. After showing and discussing some of the related background material with her, she responded, "Really?? I can do that?? I think I will major in CS!" Teaching and mentoring students brings me much joy, and I will actively continue this tradition as a faculty member.

I believe that my enthusiasm for teaching, mentoring, and research, along with my experience in teaching and TAing, have prepared me well to design and teach my own courses as a faculty member in computer science. I am excited to teach any introductory computer courses for majors and non-majors, and my graduate research experience particularly qualifies me to teach advanced courses in software engineering, operating systems, and architecture. I look forward to expanding my teaching and mentoring experience in a university environment and working with other faculty members to make sure that the overall curriculum is up-to-date and prepares students appropriately for their careers and future research goals.