

Teaching Philosophy Statement

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The teachers I have had who stand out in my memory have some attributes in common: they presented their subjects in a way that caught my interest, clarified difficult topics and led me through complex areas, and put knowledge into context so that its relevance was apparent. These role models have influenced my approach to teaching. I view myself primarily as a facilitator of learning, rather than as an expert who simply delivers information to students. When planning a curriculum or interacting with students, I am always conscious of their different learning styles and rates, what they have already learned and what they will need to learn in the future. Feedback from students has been vital to the process of growth I have undergone since I began teaching. I learned from them, for example, the pacing of lectures, and effective ways to help them learn. Personal contact with students is essential to my approach. Many need encouragement to talk to their teachers, so I emphasize my availability for informal discussion and my willingness to help them sort out any problems they have with what they are learning. My experience as a teacher is greatly enriched by this contact with students. Following steps are comprised in my teaching philosophy.

Teaching in General

During my over seventeen years of math teaching career, I taught a lot of different courses to students with a broad range of needs, knowledge, and cultural backgrounds. I taught freshmen classes and high level graduate classes. Several important general principles that I try to use in my teaching practice can be formulated as follows:

1. No matter how experienced a teacher is, every new class and every new student pose a challenge. For excellence in teaching, there is always room for improvement.
2. As a teacher, I have to appeal to different learning styles, to offer a variety of instructional experiences, and to keep an open mind to new teaching techniques to give every student the opportunity to participate fully and actively in the learning process.
3. Being a successful teacher depends on creating a learning environment with the open exploration of ideas, a relationship in which students feel respected as well as challenged. Students should be encouraged to stretch themselves a bit beyond their level of comfort and be given an opportunity to leave every class feeling that they have overcome a new challenge successfully.
4. Teaching should be an integral component of the creation of new knowledge, an initial step toward continuing education, and first of all, self-education.
5. Though student satisfaction is important for better learning, teaching - especially in mathematics – I always provide easy but challenging problems in class to create interactive environment in class. A teacher is responsible to the society in general, and should resist the pressure of lowering academic standards in education.

Teaching of Mathematics

As a teacher of mathematics, I like to take advantage of the fact that mathematics is a very special subject:

1. Mathematics is an excellent intellectual game where all the players win.
2. Mathematics is also a model that can be used for developing independent and critical thinking.
3. Mathematics can be seen as a language that allows us to communicate ideas precisely between ourselves.
4. Finally, mathematics is a tool used in natural sciences and, thus, a required discipline for many students.

I consider mathematics to be a challenging subject to teach right, which makes it especially attractive for me. I try to use every possibility to expose students to the exciting world of mathematics, often implicitly, so they may not even notice it at first. My main goal is to help students to become independent mathematical thinkers, capable of approaching, framing, and solving problems on their own. I attempt making my classroom to be an engaging place, where there is more discussion than lecture, and where students always feel free to contribute and ask questions. I think that student's participation is crucial for learning mathematics. In high level graduate courses, I sometimes even ask students to prepare and give lectures instead of me.

Teaching Style and Methods

I prepare my classes thoroughly, but I like to improvise whenever possible. I want to be interrupted during my lectures; and I always welcoming and appreciation for good questions and comments from students. I open each session with a brief reminder of the previous session's material and an outline of the day's topic, and I typically conclude with a summary of key points. There is a special session for review before every major test. I usually speak clearly, loudly, and slowly, but enthusiastically. Students are encouraged to learn from each other as their grades are not curved, thus, students are not competing with their classmates. In some classes, I give group assignments and homework to create a study group for better interactive environment for the whole semester. I distribute solutions to homework problems, quizzes, and tests in respective time. To reduce students' anxiety about tests, I make old exams available on the Web, and often give practice and sample tests before every test and exam. I usually give a test on prerequisites during the first week of the course, usually in first or second lecture. I do not consider memorization to be the most important in math courses. Assignments and projects are naturally integrated into my courses. I spend time explaining the assignments and solving similar problems in class and in tutorial session for further discussions.

Students respond will to this approach as demonstrated by evaluation comments and online discussion excerpts. Student learning of core concepts is enhanced as is their ability to think independently. Most importantly, for the service courses, student perception of what mathematics is fundamentally changes.

I generally follow the common practice of the department and traditions on specific courses. Grades are mostly based on evaluation of a content-learning. At the same time, I also implemented several ideas in my classes that seem to be not very typical:

1. Grades are normally not curved, but, there is no limit of high/low grades.
2. I use weekly/bi-weekly quizzes, assignments, tests and avoid giving partial credits in low-level undergraduate courses.

My policy not retaking tests is unique in the department. Every student has an opportunity to retake his/her missing test with an evidence of valid reason. I keep students fully informed of their progress during the semester, always announce final grades before the end of the semester, and give every student a last chance to improve the final grade during the week of finals.

Teaching and Technology

Technology is an essential and integrated part of my teaching. It is crucial for students to feel comfortable with the technologies that are becoming available; they need to know how to use a new technology effectively, what its limits are, and what to do when the technology fails. I am quite interested and familiar with recent innovations. Computer simulations and numerical experiments are traditional parts of many courses I teach.

All my course materials are available on the Internet, including syllabi, homework assignments, and tests. I create interactive Web page for several courses, where students can (anonymously) ask questions and make their comments long before such tools as Blackboard were available. In several recent classes, it was required that all students prepare their projects reports electronically and submit them through the Internet. I encourage students to help me in developing Internet pages for my classes.

Teaching and Research

I incorporate research activities into my regular teaching whenever possible. In all my high-level graduate classes student research projects are required. In several cases, project results obtained by students in my classes were significant enough to be included in my journal articles. Scientific programs written by students as their class assignments were made publicly available on the Internet. In Fall 2014, I taught “Partial Differential Equations” in third year math and physics students. I had designed the course with several assignments and projects which were very effective for students. Especially, I gave them projects with real world engineering problems by solving in both analytical and numerical methods. The students were encouraged to use advanced programming technique for each projects. I found this helped them to learn the course in depth which lead them for further research program.

Conclusions

I have invested a great deal of time learning about and observing various teaching methods. I draw from my experiences as a learner and from my knowledge of current literature in higher education to make the course experience one of lifetime learning for all of my students. Teaching is an enjoyable challenge with infinitely rewarding outcomes. The key to this challenge is to find the passions that drive us to study and understand mathematics and that will lead us to discover what drives our students.

In this process, the most fundamental question I ask is “what do I want my students to get from this course more than theorems and formulas?” Once I identify this component, I build my course around that ultimate goal.

Future Teaching Goals

I would like to teach a variety of courses at different levels in a university setting. I have enjoyed teaching second and third year courses and would like to continue teaching other year courses such as pre-calculus, applied calculus, applied differential equations, numerical analysis, mathematical modeling, fluid mechanics and so on.

In future math courses, I would like to try a new technique of using weekly tutorial sessions to have students present their solutions to problems. I have tried out this technique in review sessions in previous courses with some success.

I would like to integrate it more tightly into future courses to provide students more opportunities to interact with each other and the instructor. Over the course of the term, each student would have to present one problem (which they receive about a week in advance) and would be evaluated on correctness (50%) as well as clarity and presentation (50%), contributing around 4% to the final grade.

I am also interested in teaching graduate courses, especially in my area of research, numerical algorithm, scientific computing, and mathematical modeling and in related areas. In addition, I would like to design and develop curriculum of those courses for graduate level students.



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