

A statement of Teaching Philosophy

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As a professor of theoretical physics, I am interested in teaching students to develop critical and creative thinking ability, which is consistent with university mission. Critical thinking and problem-solving skills are some of the most important assets that physics has to offer students regardless of their major field. This necessarily requires teaching effectiveness which implies the ability to instill in students the love of learning and teach them that the real value in their education is not found in their grade point average, but in knowledge and way of thinking that they take away when they graduate. It is imperative that I do everything I can to see that they leave classroom with critical thinking and problem-solving skills to face future challenges, as well as an appreciation of the beauty and wonder of physics and the natural universe.

The pedagogy of teaching physics presents unique challenges. For undergraduate students, great effort must be made to engage them in the learning process. For graduate students, topics are far more specialized and focused, so students do not need to be convinced for the value of experience since they are there because they choose to be. I strongly believe that to be an effective professor, I need to be current in literature and research. Scholarly research and teaching effectiveness are intertwined and inseparable. For example, I have some publications that deal with basic concepts and fundamentals in physics at the freshman students level and others at senior level in the field of quantum mechanics. I usually touch the results of these publications in teaching relevant courses and my observation tells that this stimulates the awareness and curiosity of students. Therefore, my approach in teaching is a reflection of my approach to physics research. It gives a pleasure in attacking complex problems, not because they are complex, but because by breaking them down and systematically unraveling the mysteries they hold I can hope to gain insight into the fundamental physical principles at their core.

Active teaching techniques and interaction in the classroom are great tools when used in an appropriate and effective manner. So as a physics professor, I implement different teaching styles to meet different learning styles of students, e.g lecturing, solving home work style problems, asking peer-instruction questions, and demonstrations. Learning is a journey with a professor and students walking together through the material. The journey is easier to follow if there are clear objectives and goals and boundaries laid out at the beginning of the semester. These form the basis of the journey, same as the road map of a tour journey in a big crowded city like Chicago.

Since physics is about mastering concepts, students need to be challenged by throwing less information and formulas but more understanding. To keep students engaged, starting with my own

enthusiasm for the subject, exciting demos, and humorous examples. Physics is built on the notion that a few physical laws govern the world around us, students respond favorably when I connect physics to real-life situations. Challenging students to think about what they observe in everyday situation is a great way to open their mind. I spend most of class time discussing and applying major results rather than detailed derivation. My focus on ideas and concepts and understanding extends beyond classroom. On home works and exams, I require students to explain and illustrate their work. All the exams I give (except introductory physics courses) are open book ones. This allows enough time for students to spend on understanding the ideas, concepts, and the mathematical formulas, and to learn how and when to use them for solving problems. Student always come to my office and express their appreciation for my strategy of lecturing and open book exams, rather than just memorizing formulas for the exam and forget them afterwards. I also noticed that students subject to this learning strategy feel and taste the beauty of physics and they acquire high self confidence in what they learn.

It is important for the professor to be well prepared for class with well-thought out lesson plans and materials. A successful professor makes objectives clear and breakdown concepts into pieces being small enough to digest, but contain enough substance to remain interesting. This keeps students engaged and continued to be motivated.

I feel very strongly that to be an effective professor, I need to treat students with respect. I must attempt to know each student strength and weaknesses, and accommodate comments and questions at any time. My job is not to show them what I know, but to teach them what they need to know and above all to facilitate their learning.

I must mention here that this teaching philosophy is in part founded during my graduate study for the M.Sc and Ph.D degrees in Illinois in the United States. There I met some great professors who had their impact and influence on my vision of teaching philosophy.