Teaching Philosophy

A. M. Hamed

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I love Physics, and therefore I enjoy teaching it. I believe that my ability to communicate Physics, at a level that is intelligible to the general student, is a direct reflection of my understanding of Physics. Over the last 10 years, as I have taught a number of graduate and undergraduate Math and Physics courses, I have been made aware of those areas in which I have a strong conceptual understanding, and of those in which I do not. This has allowed me to improve my weaknesses and to be confident of my strengths, which has proven beneficial both in the laboratory and the classroom. My greatest joy in teaching is to see my efforts in the classroom, and the many additional hours outside of it, translate into improved understanding and performance by my students. An added joy is to have this effort recognized, not only by my former students, but also by the administration for which I taught. For example, in 2003 I was very honored to have been awarded, by the Wayne State University Physics Department, the Daniel R. Gustafon Memorial Award for excellence in teaching.

Many undergraduate students are intimidated by Physics. The main challenge that I faced (in the courses, recitations, and laboratories that I taught at Texas A&M, Wayne State, and Garyounis Universities), was exciting and engaging such students. Practically, the major challenge is translating the student’s conceptual understanding of Physics into strong problem-solving skills. This critical thinking process (arriving at an explicit solution to a problem from a conceptual understanding) is one of the most important skills that Physics has to offer the undergraduate student.

My teaching experience at the graduate level consists of frequent substitution for my supervisor during 2003-2006 at Wayne State University, and helping to advise graduate students at Texas A&M University. I have taught many chapters from Advanced Classical Mechanics, and Classical Electrodynamics at the graduate level. While it is true that the graduate curriculum is far more specialized and focused, I have found that it is important for the graduate students to recognize that Physics is more than just solving problems and memorizing formulae. It is most important to understand the theory behind the equation, think about special cases, to sense the limitations and applicability regime of each model/theory, and to determine how these are related to the initial assumptions in the model/theory. I consider teaching Physics at the graduate level a valuable tool for exploring the beauty of Physics, by observing how the complexity arises from basic principles and concepts in Physics.

My research in high-energy nuclear physics involves the most fundamental aspects of nature, and is interconnected with particle physics, condensed matter physics, plasma physics, cosmology, and astrophysics. Exposing students to these exciting aspects will encourage them to embark on a professional career in science. Experimental high-energy research will provide an opportunity for the student to gain valuable skills through direct engagement with various aspects of hardware, software, and statistical methodology. In addition, working on experimental high-energy physics familiarizes the student with advanced computing facilities and environments involving a large number of scientists. My analysis focuses on the rare probes like direct $\gamma$ and heavy quarkonia measurements and would provide good opportunity for students to participate in different aspects of the research, including detector assembly, detector calibrations, simulations studies, and data analysis. On a daily basis and through weekly meetings, I will guide the students, and provide them with essential materials, explaining basic ideas and monitoring their progress.

Finally, of the many important factors for a successful teaching career, I believe that the profound understanding of Physics by the instructor and the contact time with students are the two most critical ones.