Statement of Teaching Interests

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Philosophy

Mechanical Engineering as a discipline has a dichotomy in its focus. Half of the material is theoretical while the other half is practical application. Because this dichotomy can exist within even a single course, one of the most important jobs for any instructor of Mechanical Engineering is to bridge this gap. It is much too easy to lose a practically-oriented student while investigating the technical or mathematical background of a topic. Despite the seemingly huge disparity in the types of learning that these two aspects require, neither the theoretical nor the practical exist in a vacuum. They each drive the other, and it is most satisfying when as a instructor I can help students see the mutual influence, and thus gain a fuller understanding than just knowing either aspect alone.

As an instructor, I see my main purpose as being a resource to help solve problems and emphasize the application of the theoretical, while not losing sight of the higher-level concepts. Problem solving, the pedagogical sense is a skill that can benefit anyone. I see it as imperative that I not only show where problems may arise and how to prevent them, but also to teach students how to solve them on their own. There is no shortage of problems in Mechanical Engineering or in real life.

Problem solving when applied to why a car will not start is no different than when applied to the design of a mechanical element. There is a logical process to investigate problems, and the students who internalize this process should succeed better in Mechanical Engineering and hopefully in life as well. It is my job to make this process evident and to instill its value and utility.

To ground and unite concepts, my lectures often start with a theoretical description of the new topic or problem to solve, followed by guided class participation attempting to construct a solution.

With several solutions proposed, we then examine the tradeoffs that may make a certain approach better than another. These new concepts are put into practice through weekly labs, usually done in recitations. Quizzes, tests, and take-home projects review the learning progress made and serve to tie larger concepts together.

One of the main benefits of being an instructor while still a student is that I remember those aspects of teaching that have been most successful for me. My teaching reflects those instructors who have had the most influence upon my own education, and there seems no better way to reach my own students than to emulate their strengths and combine them with my own personal style.

As an instructor, I represent more than an opportunity to get a good grade. I strive to help all students gain a passion for Mechanical Engineering and learning in general, one that I myself have and attempt to demonstrate in both my teaching and my outside projects. There is a wealth of knowledge and understanding to be gained both about Mechanical Engineering and life, much of which is to be gained outside of school. If I succeed in inspiring my students, they will learn on their own how to be better Mechanical Engineers.

During my experience as a graduate student, I have taught twelve different courses over six semesters, and have also been a teaching assistant for two more semesters.

Interests

My interest is simply that I want to teach any of the multiple facets of Mechanical Engineering. My previous experience has required me to spend considerable time refining my approach to teaching, but that is not the full extent of my interest or ability. My research in Mechanical
Engineering has allowed me to appreciate the formal thinking of Mechanical Engineering problems. I would enjoy the chance to bring the foundations of solving problems through good design to students developing maturity in Mechanical Engineering.
My graduate classes and additional research has also had a considerable focus on the Fluid Structure Interaction. By emphasizing my computational experience, I could bring my experience and insight to students.
I am also interested in helping undergraduate students plot their college career through classes, internships, and advising. My own undergraduate experience is recent enough that I appreciate the importance of choosing classes that are enriching and stimulating while still meeting the necessary requirements for graduation.

Objectives

My primary goal for being a Mechanical Engineering instructor is to educate students for the future, be it as competent professionals or passionate academics. I want to use the experience and education that I have received to help ground the abstract through useful analogies. In a practical sense I want to teach how to solve problems with well engineered solutions. This includes a true understanding of the inner workings of the mechanical elements. I want to tie concepts across the curriculum into a cohesive picture.
My final goal, but certainly not the least important, is that I want to continue to improve myself and my teaching. I am interested in learning what others have found to be successful methods of teaching Mechanical Engineering. I want the chance to reflect on what I have done well or not so well, and take from that and build a better class for the next time.

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