

Philosophy

At the most basic level, my professional philosophy boils down to the pursuit of excellence. I aim to endow all of my students with a greater respect for the value of excellence in all they do. An unwavering pursuit of excellence results in better engineers, but more importantly, better people. I want my students to carry with them a sense of pride and a motivation to put forth nothing less than the best. I aim to model excellence in my own pursuits, as example for both my students and my peers. In this narrative, I first relate a short personal history that frames the passion I bring to my position. I then relate several supporting threads that illustrate how I bring the spark of curiosity and different aspects of the rigor and excellence to my classroom.

We are all an amalgam of experiences and influences, and to better present my evolution as an educator, I present some personal history. My first role as educator came to me as a junior in the high school marching band color guard. I was placed in a leadership role then and continued teaching one or more color guard groups throughout college and beyond. I loved the reward of involvement in the lives of students. It was on a marching band field that I learned how to motivate students to strive for excellence and push them beyond what they thought possible. Even after becoming a research engineer in industry, I continued teaching color guard part-time. After a few years, I took an opportunity to combine my passions (science and working with young people) and stepped into the role of high school science teacher. I genuinely enjoyed sharing my enthusiasm for science, but I quickly realized how sorely I missed my active participation in research. Those years as scholar, followed by years as teacher, made it clear that I belonged in academia, where the delicate balance of both is expected. I earned my Ph.D. and then found ECU Engineering, where the genuine respect for the teaching component aligns with my own view. This brief history lesson underscores the fact that I am, organically and unavoidably, an educator. It's just what I do.

As an *Engineering* educator, I am tasked with the comparatively dry objective of

helping my students better understand how an object responds to forces. That is true for dynamics, mechanics of materials, solid mechanics, and vibrations, all topics I have taught since coming to ECU. With every lecture, as I walk my students through the process to get "the right answer", I try to underscore the fact that the answer doesn't matter without context. What do your answers *MEAN*? I use physical models and props as often as the subject matter allows to help students connect the math in the book to the physical world in which we engineer. I have developed an admittedly corny playlist of songs with tangential connections to the subject. I try to relate the abstract numbers and lines to tangible situations and familiar objects, and get them to nurture their mechanical intuition about the way the world works. I also try to be unapologetically enthusiastic about the underlying beauty in the mathematics and the satisfaction gained from understanding how it all fits together.

I am also unapologetic about my high expectations. By and large, experience has shown me that folks live up to expectations, so I aim high. I also aim to provide the support required to reach those high expectations. In a number of my courses, the summative project includes some style of professional communication. One semester's vibrations course ended with a student poster session. Another semester's vibrations course resulted in three RCAW submissions. My mechanics of materials course, required of *all* Engineering students, now culminates with students writing a technical memo, detailing a failure analysis on a real structure of their choosing. The segue from my classroom to my lab has often happened because a student responds to and gravitates towards the rigorous expectations.

Those high expectations have also brought academic integrity issues into a central theme that connects my teaching, my research, and my service. Academic integrity also connects to my original premise that my teaching is ultimately about excellence. It is our responsibility as educators to respond to instances of dishonesty as opportunities for growth. I have developed a process that holds students to a rigorous standard, but gives

them the opportunity to respond, reflect, and suggest an appropriate sanction for the situation. More often than not, the suggested sanctions are well-reasoned and appropriate. It takes valuable time to bring a student through that process, but again, that effort connects back to the overarching theme of excellence, and that fact that I see my role as much larger than simply trying to teach how matter responds to forces. My role as mentor may be minimal for students I teach only in a core class, but the opportunity to effect positive results remains the same.

The general purpose of an engineering education is to cultivate a problem solving mindset and support that mindset by teaching fundamental problem solving skills. Regardless of discipline, *fundamentals* are the key. Musicians play scales, athletes run training drills. Engineering education must ensure that our students have meaningful practice with the *fundamental* skills to identify, constrain, and solve engineering problems. In addition, students need the tools to frame the problems in the broader context and the ability to recognize opportunities for creativity as part of the engineering process. I am committed to using my subject areas to help teach this problem solving mindset, and to involve as many students in as authentic a way as practical. Solving a problem, however, is of marginal use without communication. Effective technical communication requires a clear direct writing style, concise representation of data, and oral presentation skills. I am committed to using every opportunity to teach effective engineering communication in concert with the technical content. Demanding logical, clear homework solutions in statics is as much an important part of the fundamental skills of engineering as clear prose or axis labels with units. All of these elements again relate back to excellence. The ability to solve a problem and clearly communicate findings makes for “excellent engineering”. The selection of evidence that follows is designed to demonstrate the excellence I aim to bring to my craft. Thank you for your consideration.