**Teaching Statement**

My teaching philosophy is goal-oriented, which means that I first define the knowledge and tools a student should gain, then build a course to meet those aims. For undergraduate courses, the student aim is to gain the toured knowledge and tools required either to study further courses or to work in industry. A graduate level course is more concerned with research knowledge and hands-on tools and capabilities.

In terms of how I relate to students, I like to think of myself as a mentor or coach, who helps students become the best they can be. In my courses, I try to maintain a positive atmosphere by keeping students involved and active. Some students are afraid to say something which might be wrong, so I try to encourage them to say what they think, even if, in the end, it is the wrong answer. I do so by giving positive feedback for their effort rather than for their answer (although I do let them know if their answer is correct or not). Finally, from time to time, I remind students that they are all smart and can have successful careers, even if they are not at the top of the class in terms of their grades.

Below, I will demonstrate how I use goal-oriented teaching in the two main courses that I currently teach.

Course: “**Introduction to Mechanical Engineering and Manufacturing Technologies**”

This course is for Industrial Engineering and Management undergraduate students. The main goals of this course are to help students acquire: 1) basic knowledge of physical phenomes in the world (heat, material mechanical properties, failure modes, and how to determine the force applied to a structure); 2) an understanding of manufacturing technologies; and, 3) understanding that enhances their communications with peers from different engineering disciplines within the industry (e.g. mechanical or manufacturing engineering).

Whenever possible, I use real-world problems that students experience in their daily routines in order to achieve the above goals. For example, I might ask: How much energy is required to heat water for a 45 min shower, and what does heating the water for the shower cost – financially, and in terms of the carbon footprint? The course also has a hands-on lab, where the students can perform experiments to understand the theoretical material, or use technology to manufacture parts. Lastly, I design two small projects to promote self-learning, and I offer the students the opportunity to gain bonus points for extra assignments.

Course: “**Occupational Biomechanics**”

This course is a graduate level course (mandatory for all engineering students), which aims to expose students to the field of biomechanics and provide basic knowledge on anatomy, physiology, and the properties of human tissues (muscles, bones, etc.). I teach the main measurement tools for human motion and effort, how to model human body mechanics (inverse dynamics), and how to analyze data/results.

The course is designed to be hands-on, using lab equipment (e.g., motion caption, EMG, and indirect calorimetry) to enable each student to use MATLAB analysis codes (e.g., the codes for calculating segment length, segment mass, 2D inverse dynamics, etc.) by the end of the course. I design six homework assignments to help the students acquire these skills. A final research project (requiring 20-30 hours of work per student), the topic of which is chosen by the students themselves, is undertaken in pairs. The project may be an extension of their own research, or a specific topic that the students feel passionate about.

Every year I update the above courses to include new developments in technologies, amongst other things. For example, last year my team and I added a new 3D printing lecture lab and removed a lab on milling, as it was somewhat redundant for turning lab that is also machining processes. I also added a lecture on exoskeletons to the biomechanics course, as this is a new technology being used for rehabilitation and in other areas of the industry. Lastly, I am on a constant quest to find new ways to make my undergraduate course more interactive.