Teaching Statement

Alisyn J. Nedoma

Problem solving is the most important skill for engineering students, and is central to my teaching practice. As an educator, I foster confidence and practical skills by providing a safe intellectual space in which students learn to overcome challenges through teamwork. My teaching success stems from my belief that an engineering intuition can be learned: by bridging the differences between fields, exploring the science behind everyday phenomena, and developing a physical understanding that is complemented by mathematical descriptions.

My pedagogical style evolved during two sequential years of teaching a polymer science course. Following feedback from students and my co-lecturers during the first year, I implemented several successful changes that came to define my teaching practice:

1. One demonstration for every fundamental concept. The demonstrations ranged from crystallizing polylactic acid in a teacup to videos of industrial extruders, and reinforced real-world applications. The change in course delivery, from listening to watching, became a cue for students to ask questions.

2. Ask students to take turns solving problems at the board. This technique requires students to communicate with and help the problem-solver, harnessing differences between individuals' problem solving techniques. By mediating the process, I can provide feedback and encouragement for students to learn how to teach one another.

3. Repeat important concepts using different delivery modes. Alternating between lecture, demonstration, and student problem solving varies the course and reinforces important concepts.

These practices improved my teaching, as reflected by outstanding student reviews the second time that I taught the class, and earned me a commendation from my department.

I would be pleased to teach any of the core classes in chemical or materials engineering (thermodynamics, transport, reaction kinetics, separations, etc.) and upper level courses in statistical mechanics, phase transitions, polymer physics, materials for energy, and nanotechnology. Over the course of several years, I would like to develop cross-faculty elective classes in scattering for soft matter (light, x-ray, and neutron) and plastic electronics. Having struggled to apply uncertainty analysis and statistical (as opposed to combinatorial) design to my own experiments, I have an invested interest in teaching these topics. My personal challenge will be to integrate practical tools for managing uncertainty into any classes that I teach.

Supervising student research is my favorite way to teach because I am wholly invested in the learning outcome. My colleagues and students have identified that my strongest skills as a supervisor are enthusiasm, perseverance, and attention to detail. Consequently, I support students by encouraging them to overcome obstacles and sifting through lab notebooks when necessary. My students have gone on to work in industry and startups, or obtain postgraduate positions. Based on these early successes, I am enthusiastic about the prospects of developing as a teacher and supervisor within a supportive academic department.