Teaching Interests: My comprehensive Chemical Engineering education from UC Berkeley and Caltech has equipped me to teach a range of classes. From quantitative engineering courses such as kinetics, transport, and thermodynamics to topics in systems biology and biochemistry, I am prepared to teach at both undergraduate and graduate levels. Also, through my research, I am very familiar with control theory, molecular and cellular biology, genetics, neurobiology, epigenetics, and bioinformatics. The problem-solving skills I acquired as an engineer have set me up for success in elucidating the systems principles of biological systems. Thus, I am enthusiastic to teach the principles of cellular and biomolecular engineering to the next generation of students.

Teaching philosophy: While at Caltech, I completed the Caltech Project in Effective Teaching (CPET) certificate program, which introduces teaching pedagogy and practices through six seminars. In teaching, I have used techniques introduced to me through CPET training including the Socratic Method, inductive teaching, and story-telling. My goal is to help my students engage with concepts and approach a deeper understanding of scientific principles. In particular, I find that requiring students to physically draw out their systems improves mechanistic understanding, develops intuition for the way processes work, and reduces experimental errors.

Teaching experience: In addition to serving as a teaching assistant for two classes at Caltech, I taught the freshman chemistry lab at Harvey Mudd College (HMC) in spring 2013. HMC is highly regarded for its focus on teaching and is currently ranked as the #1 engineering school without a doctorate program (*US News & World Report*, 2017). I received excellent evaluations with scores of either 6 or 7 in all categories (max score = 7) as well as this gratifying comment: <u>“Prof Galloway is extremely supportive of her students and she clearly wants us all to succeed, not only in lab, but in our careers as scientists.”</u> Since all HMC students are obligated to take the freshman chemistry course, many students who were uncomfortable in a laboratory setting approached the class with dread. In order to capture my students’ interest, I began each class by engaging them with a high-level view of the purpose of the lab (e.g. why do we care about error propagation, synthesis yields, carbonate chemistry, etc.) as well as a general overview of what to expect. Helping my students understand the bigger picture of the material made the labs more meaningful and empowering. With this level of engagement, I could challenge the students to think deeper when troubleshooting their experiments and analyzing their results. Whenever a student asks a question, I try to refrain from giving a direct answer, instead offering another question that leads them toward answering their initial question. Letting the students discover the answers for themselves helps them to build a better understanding and confidence in their deductive skills. Long-term, I want students to recognize that asking good questions is fundamental to science, whether in theory or in practice. One HMC student reflected that I was “always available to answer questions about lab procedure and write-up and provides ample help without any hand-holding.” Overall, my students were engaged and left with a positive view of chemistry.

Mentorship philosophy: I believe the ultimate goal of science is to promote human flourishing, and that includes active scientists and trainees. During my time as a postdoctoral fellow, I have served as a mentor to more than a dozen students, both graduates and undergraduates. I have had the opportunity to intensively mentor three women over an extended time (one to five years) at various stages in their research careers, helping them navigate challenges from designing experiments to processing personal issues. <u>For me, mentorship goes beyond scientific development and experimental progress. I want my students to be able to independently craft their vision of success and integrate that into the broader vision for their life.</u> When I reflect on the decisions I made when I was younger, most were driven by a desire to generally “succeed” or to be perceived as being “successful.” Like many bright students, I struggled with a fear of failure that limited my experimentation in new opportunities and my embrace of unconventional ideas. Over time, I realized that constructing a satisfying life required me to re-envision what success really meant and recognize my ownership of that vision. As I mentor, I want to guide my students as they construct their lives and help them to do that with intentionality. Any rewarding process requires risk. I want my students to be bold in taking risks in experiments and establishing new avenues of research without concern that failure will be viewed as permanent.

Awards: Effective oral communication is the heart of good teaching. I have endeavored to become a strong presenter, as evidenced by the awards I have won for scientific communication. In 2011, I was a Caltech Everhart Lecturer. The Everhart Lecture is granted to only three graduate students per year for both excellence in research and communicating the broader impact of their work. In 2017, I won First Place at the Annual USC Postdoctoral Symposium in a TED-style talk competition. In my presentation “Slick software, slow hardware: Reprogramming hits a wall,” I explained how cellular transcriptional machinery imposes limits on integrating synthetic circuitry. Finding creative analogies to convey complex scientific concepts makes teaching fun for both my audience and me.

Course development: At Caltech, I co-founded and led an informal “biocontrol” journal club and later co-authored a review article on synthetic biology. From my experience, I envision developing a course that I would title “Design principles in systems and synthetic biology.” This course, which focuses on molecular and system design, will formally introduce students to concepts related to my research, highlighting engineering principles in neurobiology and stem cell biology. <u>The goal of the course is to introduce advanced students from quantitative backgrounds into problem-solving opportunities at the interface of molecular biology and engineering.</u>