Stephanie J. Spielman
Teaching Statement

Teaching Philosophy

My teaching philosophy is centered around active student participation and critical engagement with course material. One of the most important, and also overlooked, aspects of scientific education is emphasizing the *source* of knowledge. Students tend to learn by memorizing facts and internalizing glossaries. Consequently, students often lack a comprehensive understanding of i) where facts come from, and ii) how to critically evaluate why so-called facts should (or should not) be considered facts.

As such, I take great care when teaching to emphasize the ever-changing, and often subjective, nature of scientific discovery. For example, in a literature-based Discussion section, I prompt students to consider whether and why conclusions in a given paper were merited. I further prompt them to consider whether entirely different conclusions could be drawn from the results presented. My approach shows students to continually question the basis for information, until they feel assured that the basis is rigorous and well-grounded—and even then, remain open-minded enough to reconsider the conclusions if/when new information comes to light. With this overarching philosophy, I lead students to master critical thinking skills, gain confidence in their interpretive abilities, and form the basis for scientific independence with the potential for successful STEM careers.

I generally embrace a semi-flipped classroom structure when teaching, meaning my lecture style is centered around "active learning". This approach consists of a dynamic back-and-forth between lecture and exercises/problem sets related to the material the students have just seen. In this way, students can directly engage with the material in real-time, providing them with a contextual understanding in an environment where they can collaborate and receive simultaneous feedback. This approach has generally been well-received; students have consistently indicated in anonymous post-course surveys that this balance between lecture and exercises was integral to their mastery of the material.

Teaching Experience

My training and extensive teaching experience qualifies me to teach a variety of both biology and interdisciplinary courses, ranging from Evolutionary Biology at any level, Genomics/Genome Science, Biostatistics and/or Data Science for Biologists, Scientific Programming, and finally research-oriented classes in Scientific Writing and Presentation.

I have gained substantial teaching experience, at both the undergraduate and graduate level, across a variety of disciplines. Currently, I teach a cross-listed (primarily Master's level) course in Biostatistics at Temple University, and this coming spring 2018 I will be teaching a course entitled "Genomics and Evolutionary Medicine", a data-driven interdisciplinary course that will introduce students to the complex interplay between human disease and genomes, contextualized through the lens of evolutionary theory. For my current course, Biostatistics, I have developed the entire to emphasize cutting-edge data science techniques (in the language R), as applied to biological questions. My course focuses on practical applications of methods in Biostatistics so students can gain tangible skills that they can immediately apply to their current work or other courses. Importantly, the skills I emphasize in this course are readily translatable to and highly-prized in STEM careers across academic, industry, or government alike.

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While completing my graduate studies at UT Austin, I served as a Teaching Assistant for several classes, including Biostatistics, Evolutionary Biology, and Computational Biology and Bioinformatics. For each course that I TA'd, I hosted "extended" office hours, with up to 15 students attending on a weekly basis. My office hours effectively became supplemental course time during which I worked one-on-one with students, whose learning style had become passive after years of lectures alone. I was thrilled to watch how this rare opportunity for personalized contact benefited my students, who were finally able to achieve a comprehensive understanding of material that had previously confounded or overwhelmed them. In fact, this feeling proved mutual: Even after these classes had ended, I invited students to continue visiting my office, and I subsequently mentored several of these students during the remainder of their undergraduate education at UT Austin.

I was additionally involved with multiple independent teaching initiatives through UT Austin's Center for Computational Biology and Bioinformatics (CCBB). For two spring semesters, I co-taught and co-designed, with a fellow graduate student, a "Peer-led Biocomputing" class geared towards biologists, of any educational level, at UT who wanted an introduction to computational and programming skills to bolster their research. Each semester, between 10-20 students attended this course, in which we taught fundamental computing topics such as command line navigation (UNIX), introductions to the languages Python and R, version control with git, and analysis-specific topics like RNA-seq, automating BLAST searches, or multiple sequence alignment. I also ran, for two summers, the "Introduction to Python" course as part of CCBB's intensive week-long Big Data in Biology Summer School. For this short course, I designed a curriculum to introduce students the fundamentals of "scientific computing," that is, leveraging computer programming for the specific purpose of scientific inquiry.

Finally, I strive to engage in outreach educational initiatives. For example, during May of 2017 I co-taught a two-day workshop, called "Functional Ecological Genomics Workshop," at the Lacawac Sanctuary's Biological Field Station and Environmental Research Center, located in Lake Ariel, PA. Roughly 15-20 undergraduate and graduate students attended this immersive workshop, during which I led interactive lessons on, i) how to analyze genetic data for signatures of natural selection, and ii) the fundamental computational skills needed to employ these genomic analyses. Ultimately, students returned to their home institutions with a new set of powerful skills to bolster their research programs and/or prepare them for future graduate research.