Teaching Interests

My teaching interests in general include molecular population genetics, molecular evolution, and evolutionary genomics. As my approach to research in these areas has involved both empirical and theoretical/computational components, I believe that I am particularly suited to teaching courses that emphasize a "learn by doing approach", where students are encouraged to work directly with data and the tools that are available to analyze them.

As a graduate student, I was a teaching assistant for Marty Kreitman and Tom Nagylaki's undergraduate course on molecular evolution, where I was in charge of running the lab portion of the course. The lab involved repeating classical studies in molecular evolution, often taking advantage of the larger amount of data currently available. I feel that students benefit from courses like this since they see what is actually done in order to process data, test hypotheses, and arrive at conclusions. However, I would extend this idea to include elementary programming exercises which require students to write programs to perform basic analyses. Given the increasing amount of data that students collect while doing research, I feel that almost every student in biology benefits from having some familiarity with programming languages designed for data processing (e.g. perl), or statistical analysis (e.g. R), even if their main interests aren't in computational or evolutionary biology.

Undergraduate classes that I would be particularly interested in teaching would be introductory courses in population genetics and molecular evolution. These courses would cover classical concepts with an emphasis on how genome-level technologies can be used to address both long-standing questions as well as to pose new questions and stimulate new research in evolutionary biology. I would motivate the specific topics covered in terms of their biological relevance, introducing the mathematical, statistical, and computational concepts that can be brought to bear on them. Students would then be exposed to topics in elementary probability theory, and the application of Monte Carlo methods in simulation, and have a chance to develop skills in programming and data analysis via independent projects.

For graduate students, I would be interested in teaching special topics reading courses in evolutionary genetics. One example would be a course in methods in population genetics, focusing on techniques for making inference from data, and implementing them when possible. A second example would be a "classic papers" course, likely using a classic treatise (such as Kimura's "Neutral Theory of Molecular Evolution"), or book on an aspect of the history of the field (e.g. Provine's "History of Theoretical Population Genetics"), as a starting point for discussion and to motivate the choice of papers.