# Andrew Whitehead – Teaching

## Overview and Philosophy

My teaching experience has ranged from workshops for environmental professionals, to upper-division undergraduate courses in Evolution, and graduate courses in Evolutionary/Ecological Genomics and Ecotoxicology. I find few things as immediately rewarding as catalyzing a deep and meaningful understanding of a fundamental concept.

My undergraduate teaching stresses the importance of learning not only key facts and principles, but the integration of information across disciplines and thinking critically. Writing assignments are important for synthesizing information and strengthening communication skills. Though I recognize that a few students may choose careers as professional research biologists, many will choose careers in government and the private sector and all are future taxpayers and voters; accordingly, I seek to instill a fundamental appreciation for both basic and applied scientific research.

For graduate students, the emphasis shifts to fostering critical assessment of the literature, mentoring toward important contributions to the literature themselves, and encouraging big-picture cross-disciplinary thinking. I have found that student education has benefited my research efforts, and perceive teaching as an important contribution of faculty to the community.

At LSU I have gained five years of experience teaching "Evolution" at the undergraduate level, and have developed and implemented a new graduate course "Ecological Genomics" which I have taught four times. During graduate school I was a teaching assistant for a course in Environmental Toxicology, and could design and teach relevant courses at the graduate and undergraduate levels at UC Davis.

## Ecological Genomics (LSU, BIOL 7800, graduate course)

The purpose of this course is to provide both a conceptual and methodological foundation for the new and rapidly emerging field of Ecological Genomics. This scientific discipline seeks to determine the structural and functional significance of genomic variation within an evolutionary and ecological context, with the aim of understanding how genomes integrate cues from, and are ultimately shaped by, the environment. We examine how genomic technologies and approaches, that have recently emerged and are currently revolutionizing the biological sciences, may be applied to reformulate or solve ecological and evolutionary questions. The course starts with an introduction to genomics tools and analyses, and the remaining bulk of the course examines how ecological and evolutionary questions may be evaluated using these approaches. Class meetings involve a mix of lecture and discussion of assigned readings from primary literature. Evaluation is based on quality of discussion participation, a literature review, and an NSF-style research proposal.

### *Evolution (LSU, BIOL 3040, upper-division undergraduate course)*

The main foci of this course include population genetics, phylogeny reconstruction, speciation, adaptation, and evolutionary genomics. A fundamental understanding of the theoretical underpinnings of modern evolutionary thought is achieved through communication of experimental evidence. Emphasis is placed on conceiving of evolutionary biology as a dynamic, synthetic, far-reaching, and data-driven science. Student learning is evaluated by a variety of methods including multiple in-class quizzes, writing assignments, and take-home problem sets. This course is communication-intensive. All tests and assignments require written answers, and students are provided with the opportunity to improve their writing skills by capitalizing on feedback from me followed by re-evaluation of their improved work. Since this is how science works (feedback from peers on grants and manuscripts), I think it is important for students to improve their work in a parallel context.