Statement of Teaching Philosophy

"This course is challenging, but with the help of the instructor, I was motivated to work hard and remained highly interested in the course material."
This anonymous student comment from a course evaluation captures my primary goal for teaching undergraduate students and makes me proud to be an educator.

My goals
I have three fundamental goals in my teaching career. First, and above all, I want to help my students develop an internal sense of control when it comes to their education, where they feel like they can learn and achieve anything they put a full and honest effort toward. I strive to help students achieve their academic goals in a way that encourages them to take a responsibility for their performance and feel a real sense of accomplishment, increasing their confidence and independence to become active members of their college and communities. I'm passionate that students gain this perspective during their college years, as I consider these among the most valuable lessons I learned during my own education at a liberal arts college. A second goal is to design my courses to help students develop the critical skills of reasoning, writing, and learning. Data indicate that students will likely change their careers at least once in their lifetime. Learning throughout a lifetime, being able to problem solve and communicate effectively will serve students regardless of their specific career. Really, we see only the beginnings of what students can achieve when we teach them as undergraduates. It is incredibly important to me that I am able to help prepare students so they can be successful in getting and keeping that future position that will help them become leaders in their chosen field. Third, my goal is to help students develop a strong foundation in neuroscience, including experimental design and analysis, and knowledge about the brain that they can build upon throughout their careers.

My approach
As a neuroscientist, I reflect on my experiments, analyze my data and read the work of scientists before me. In the same way, I analyze my teaching methods, both in terms of their strengths and weaknesses. I seek feedback from my students in the form of a midterm evaluation and I learn from the successful strategies of colleagues. By attending "Neuroscience Education" symposia and poster sessions at annual Society for Neuroscience meetings, I have learned a great deal from faculty from different institutions about the activities and courses they have developed for their students. I also actively participate in more formal instruction by attending workshops on student-centered course design and an individual consultation on one of my videotaped class sessions with staff from the Teaching, Learning, and Technology Center at UCI. I keep the equivalent of a "lab notebook" when I teach a class, noting what worked and what didn't, what activity took half as long as expected and how it can be improved, and what concepts students needed extra help understanding. As a result of education in teaching pedagogy and best practices, as well as my own reflective process, I've incorporated several main principles into my teaching to help achieve the goals described above.

First, and most importantly, when I design a course, I start with my goals for the students (i.e. what do I want them to be able to do by the end of the course). Then I decide the kinds of assignments and activities that would help the students practice and develop those skills. Then, finally, I consider course content and how it can be reinforced by the assignments and activities to support the course goals. One of my goals for students is that they be able to read scientific literature so they can be judicious consumers of scientific information throughout their life. One in-class activity to practice this skill was an effective extension of a lecture on neurotransmission. Students divided into groups and read some scientific literature I provided on the mechanism of action of black mamba venom, nerve gas, botox, etc. Feedback indicated that they found the

neurotoxin activity very interesting, and at the same time they were working through some challenging literature together, integrating the new terms with concepts we had just learned. Then the students took turns describing the mechanism of action of the toxins to the rest of the class and identifying the step of synaptic transmission targeted by each toxin. Another important goal is to help my students improve their writing skills and to be able to apply information that they learn about the brain to other situations. In one assignment after learning about the basal ganglia and its role in voluntary movement and Parkinson's Disease (PD), I direct the students to literature describing various treatments for PD. Each student gets to choose the treatment that interests him or her most and then provide a written description of the treatment and how/why it would be expected to affect the symptoms of PD based on what they have learned about the neurobiology of the disease. In addition, the students are asked to indicate whether they would choose this treatment for a loved one, and thus evaluate the benefits and drawbacks of the treatment.

In addition to designing a course around my goals for the students, I distribute the total points over a variety of assignment types (presentations, essay, informal response, etc) to ensure that students with different strengths will have the opportunity to demonstrate their understanding of the material in a way that is interesting for them. Furthermore, whenever practical, I give students a choice regarding the specific topic of their assignment. These approaches increase motivation, sense of ownership and responsibility over the process and final product, to help foster the internal locus of control that I desire for students. I also give students lower risk assignments (worth fewer points) to practice skills I expect them to master for the assignments/exams that constitute larger portions of the grade, and provide early, detailed feedback, including daily quizzes at the beginning of class so students can gauge how well they understand the material and I can identify concepts that need additional attention.

The daily quizzes also help ensure that students have prepared for class. Memory researchers have shown that the deeper we process information when we first encounter it, or the more connections we are able to make between the new information and things that we already know or have experienced, the longer we will be able to remember the new information and the more flexibly we will be able to use the information. If students have read the material before class, I can help them integrate concepts into that existing framework of knowledge. Likewise, when presenting new information, I always try to connect it back to things we have already discussed in the class. For example, in a discussion of schizophrenia, when I tell students that there is cell death in the prefrontal cortex of schizophrenic patients, I remind them that we talked about the prefrontal cortex in Week 1 when we learned about the different areas of the brain and ask them to tell me its function. Based on what they know about the normal function of the prefrontal cortex and this new information about reduced prefrontal cortex activity in schizophrenics, I ask them to predict the cognitive deficits that might be present in schizophrenic patients. Then I can follow this example with a discussion of the general approach and emphasize how they can use this strategy: By knowing the function of a brain area, they can predict the behavioral or cognitive deficits that might occur when the area is damaged, or vice versa, by observing behavioral or cognitive deficits in patients with known neuroanatomical damage, they can predict the normal function of the damaged area.

While I have had several opportunities to teach, and thereby develop some of the principles above, I am well aware that I have a lot to learn. In the classroom, I will always need to learn from students about how to best motivate them. These approaches will continually evolve as the experience of students changes. I don't find this realization daunting, but rather I find it exciting, because I truly enjoy the process of learning and look forward to sharing that process with my students