Steuard Jensen **Statement of Teaching Philosophy**

The primary goal of every physics class is to teach students how to think like a physicist. In part that means teaching specific skills, from general scientific reasoning to tensor calculus and path integrals. Just as important, it means sharing the scientific beauty of the physical world and the thrill of understanding it. I strive to have my students actively thinking like physicists within minutes of entering the classroom, and when solving problems I push them to explain not just what to do, but why.

To keep students involved and thinking during class, I try to include a "think/pair/share" activity for one step of most examples: every student writes down her own answer and then discusses her reasoning with a neighbor. This peer instruction is valuable for students of all abilities, and in some cases the activity can launch a broader discussion. For problems that are longer or less concrete I break students into small groups; doing this even on the first day of class shows the students that I trust them to succeed. Constructive feedback is crucial for all of these activities: even when an answer is wrong I find some point of reasoning to praise.

As for course content, I explicitly embed every concept in a broad knowledge structure for physics. Thinking like a physicist means internalizing the relationships between ideas, and guiding that development is the teacher's primary role. Along the way I discuss common misconceptions to help my students see where their expectations must change, and I teach them to solve problems by breaking complicated scenarios into simple steps where the relevant big ideas are clear. In short, I spend class time discussing and applying major results rather than deriving them: the textbook is there to connect the mathematical dots.

My focus on ideas and understanding extends beyond the classroom. On homework and exams I require students to explain and illustrate their work: equations without English are not enough. I sometimes dispense with math entirely, assigning "micro-essays" as homework or using writing activities during lecture (two ideas that were suggested in pedagogy meetings in our department last year). When students ask questions during office hours or online, I do not just point them to the answer but guide them through a physicist's reasoning to the solution.

I use several strategies to keep students engaged with the subject, starting with my own energy and enthusiasm. I look for exciting demos (such as a hovercraft to test the relationship between force and acceleration) and humorous examples (including a "hamster analogy" for circuits). I also try to tie the active, hands on experience of lab to the ideas and problem solving of lecture: treating them as a single integrated course can make both more rewarding, and I have rewritten and reorganized parts of our introductory lab curriculum to strengthen that connection.

Every course must fit the students who take it. Because my current general physics class is aimed largely at premeds I often choose class examples and homework problems relevant to biology or medicine, including a discussion and computer simulation of MRI to illustrate quantum phenomena. Many of these students are rusty on math, so I gradually introduce concepts from vectors and calculus as needed rather than all in a rush in the first week.

I look forward to eventually teaching most of the courses in the curriculum. I have thoroughly enjoyed teaching at the introductory level as well as running a wide range of undergraduate labs. I am scheduled to teach statistical mechanics in the spring, and in the future I am especially eager to teach theoretical mechanics, intermediate electromagnetism, and quantum mechanics (at any level), as well as advanced topics such as general relativity and particle physics as needed. I have also given thought to a "great ideas in physics" course for non-scientists, because with good teaching I believe that everyone can learn to think like a physicist. I look forward to sharing the excitement of doing so with excellent students for many years to come.