

# Statement of Teaching Philosophy

**Jing-Han Chen, Ph.D.**

Department of Physics and Astronomy, Louisiana State University, Baton Rouge, Louisiana

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As a physicist, I am motivated not only by finding principles behind phenomena, but also explaining them to others. I receive great pleasure from explaining physical concepts to students and colleagues. I am a physicist who has extensive research experience with faculty and students with material science and engineering backgrounds. Therefore, teaching courses for students in the physics and material science major is an exciting and important task. While pursuing my doctoral degree in applied physics, I have taught several recitation sections for both undergraduate mechanics and undergraduate electromagnetism. I have also served as a one-to-one tutor to assist undergraduates throughout college at all levels of physics course work. From this valuable experience, I am prepared and interested in teaching a variety of undergraduate and graduate level courses, including: (1) thermodynamics, (2) x-ray crystallography, (3) phase transitions, (4) modern physics, (5) general physics, (6) calculus, and (7) engineering mathematics, and etc. I am also open-minded and eager to develop courses based on the needs of the department or college. Below I will now describe my teaching philosophy.

Two abilities are particularly important for students to master course work in scientific or engineering subjects. One is the ability to perform abstract thinking to conceptually understand the central idea of physics principles. The other is the ability to conduct physics analysis to tackle real science and engineer problems. Enhancing both abstract thinking and practical analysis abilities are crucial for teaching successfully in most subjects of science. Physics and its related sciences requires playing, experimenting, deducing, and extrapolating from what fundamental principles you know to what practical scenarios you encounter. Students need to learn to synthesize and decipher the information, and employ the right concepts as well as the right equations for a problem, plug in numbers, and get an answer.

For two years during my doctoral career, I worked as a teaching assistant in charge of the recitations and labs for undergraduates. Most students were from science and engineering backgrounds, and the knowledge in mechanics and electromagnetism was essential for them. In the beginning of each recitation session, I introduced the problem we were going to solve that day and then taught them the mathematical tools and terminology they needed. After providing the motivation and mathematical tools, I taught students how to analyze complex problems using the given mathematical tools as well as how to apply the physics principles in the experiments during the lab class. Besides being a teaching assistant in the recitations and labs, I have also served as a one-to-one tutor to assist undergraduate at all levels. During my tutoring hours, I tended to respond to questions by breaking them down into simpler questions and guiding the students to the answer. I enjoy the process of reducing an old, familiar concept down to its building blocks, and coming up with different ways of building it back up. This experience enhanced my presentation and communication skills.

Overall, I believe that a successful course lecturer should focus on improving students' abstract thinking and practical analysis abilities. Students can benefit the most from learning the motivation, acquiring the mathematical tools, reviewing physics principle, analyzing the problem, and tackling real problems. From my teaching experience, I have seen how these strategies can be effectively adopted, and I am keen to apply them in my future career.