



# Statement of Teaching Interests

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As you know, knowledge is far more valuable when shared. Thus teaching is especially important as it imparts knowledge to others. I can still clearly remember that I started enjoying “teaching” at a young age. After I had learned something new, I was always itching to share my new discovery with my little companions. While growing up as a high school student, an undergraduate, a graduate, and even a post-doc, I have always admired those school teachers and university professors who excelled at conveying their knowledge unto me. My teaching experiences in college as a private tutor and in graduate school as a lab instructor have not only helped me to improve my teaching skills, but also have encouraged me to pursue a life-long career in teaching and research. Now that I am equipped with the knowledge of fundamental chemistry as well as research experience at the frontier of materials science, I am eager for a teaching opportunity to share what I have learned and to inspire those young and fresh minds so often found in academia.

## Teaching Experience

Lab instructor (2002-2003) for the general chemistry laboratory course at the University of New Orleans: This was my first time teaching college students, facing a new culture and using a foreign language. I was very excited, but at the same time a little nervous. Luckily, most of the students took to my teaching methods very fast as I was trying my best to extend their horizons based on my knowledge in my own research field. For example, when I was teaching them basic electrochemistry such as electroplating, I told them electroplating metals into “nano-sized templates” can produce metallic nanomaterials. This caused the students’ curiosity to peak, because they had never expected that advanced nanotechnology can be related to a fundamental general chemistry course. The students’ huge interest in my lab sessions definitely helped to encourage me. With thorough preparation for each lab session and constant thinking of how to improve my teaching methods, I became very skilled at instructing and the students made me feel as though I was one of the most liked lab instructors in the department.

Lab instructor (2004-2005) for the general chemistry laboratory course at the University of Maryland, College Park:

As a more experienced instructor, I realized that my responsibility should go beyond just sharing knowledge. There are other critical responsibilities such as helping students form habits of critical thinking and developing the ability to discover new things by themselves. One simple way of achieving these is to provide “inspiring hints”, rather than direct answers, to their questions. I usually did this by responding to students’ questions with helpful hints, just pointing them in the right direction rather than giving them the final answer. These hints would lead students to think through their problem and finally figure out the correct answer for themselves. This simple method teaches students how to approach problems, helps them understand the answers better, and more importantly, it builds up confidence in themselves to discover the solutions on their own.

During 2005 – 09, I served as a member of the Materials Research Science and Engineering Center (MRSEC) at the University of Maryland College Park, with the main responsibility of being an instructor in the outreach education program. I taught a broad range of students, including elementary school kids, high school students, homeschoolers, etc. Teaching students with vastly different backgrounds was very challenging. I devoted plenty of time to tailoring my teaching approaches to fit each one of them, and it was well worth it. Serving at MRSEC was one of my most memorable teaching experiences. One activity that I enjoyed the most was an annual program called “Operation Night Spy” held in the International Spy Museum in DC. This program was designed with various spying-related activities (e.g., boot camp, spy activity stations, and materials analysis laboratories) for middle school students to accomplish. It was a fun way for them to learn how materials science, physics, and chemistry can be applied in spying missions. My interaction with the kids involved in this program was very enjoyable. I loved seeing their eyes sparkle with the thirst for knowledge, which was why I made up my mind to pursue a life-long career of teaching science.

## Teaching Interests

I would like to teach general chemistry for undergraduate, inorganic chemistry and analytical chemistry for both undergraduate and graduate students.

Based on my own academic background and my careful study of the current course settings of the George Washington University chemistry department, I would like to design two new courses: a material science course and an electrochemistry course. Both of them can be offered to graduate students or senior undergraduate students.

The first course would cover the various aspects of modern material science, such as the fundamental properties of materials, different classes of materials (e.g. inorganic materials, polymers, and semiconductors), material synthesis and material characterizations. In recent years, nanoscience and nanotechnology has become a special focus in many universities, therefore this topic will be a main focus of this course.

The second course would be important because electrochemistry not only serves as an essential approach to synthesizing various materials, but also lays the principles for modern electrochemical energy storage systems, such as lithium ion batteries and supercapacitors. This course would cover the fundamentals of electrochemistry (thermodynamics and kinetics) and applications of electrochemistry (electrodeposition techniques, electrochemical analysis, and electrochemical energy storage).

## Teaching Philosophy

In my view, a great teacher is like a great artist who uses basic tools to transform raw materials into valuable assets of society. However, great artists may not have the best tools or best skills – they are recognized because of their passion and their unique perspective of the world. That is the difference between an artist and an artisan. Teaching is similar. Great teachers are not just ones who transmit information, teach skills, and help students earn the best grades. They are those who share their passion for knowledge and curiosity with their students, inspire the students' creativity, develop their critical thinking ability, and prepare them for the complex world they will face after stepping off campus. Based on my own experiences of being a student and an instructor, I think the following "principles" are the most noteworthy ones in good teaching:

First, passion is one of the most key ingredients of effective teaching. It leads to thorough preparation, a continuous desire to improve teaching skills, and an intense delight in watching students learn. How well the students can learn greatly depends on how passionate and how devoted a teacher is.

Second, teaching is not just a way to impart knowledge, but can also be used as a method to foster interest in the subject. Students are naturally curious. They are intrigued by the world around them. Teaching is far more effective when students are truly intrigued, because they will "actively" learn and seek new knowledge rather than feeling like they are being "forced" to learn by the teacher.

Third, a teacher should encourage critical thinking and should always strive to be respectful of different opinions. Students, on the other hand, should learn to think independently, not merely accept the teacher's opinions. A teacher should be prepared to challenge and be challenged by the students as every student possesses unique perspectives, and they should be supportive when considering their different perspectives.

Fourth, each student deserves an education tailored to his or her strengths and needs. George Washington University's campus hosts over thousands of international students. As a foreigner myself, I understand the difficulties and needs of students studying abroad. Their English abilities, cultural backgrounds and fundamental knowledge may vary greatly. It is my responsibilities to help them overcome these learning obstacles.

Finally, course materials should be presented in an interesting and interactive environment, which will make the student want to learn and retain more information. For this reason, I believe that using computer based technology such as multimedia, slides, and the Internet, is an effective way to complement traditional lectures, laboratory exercises and even exams. Nevertheless, readings combined with traditional lectures are still the foundation of the educational experience.

My pursuit of higher education and being a scientist is partly due to several teachers who have inspired me and taught me necessary skills to achieve these goals. Now I would like to join their ranks and be a catalyst for others to fulfill their dreams. I believe my great passion for teaching, various past teaching experience, strong academic background and communication skills will make me an excellent teacher.