Statement of Teaching Interests

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Teaching is an effective way to foster thinking and creativity for students. It is also a rewarding process as it results in further intellectual exploration and growth for teachers.

My teaching interests are closely related to my research ambitions. Therefore, I consider turning my research ideas into solid scientific contributions that make students think critically and creatively. Students are guided to first break through the barrier of introductory materials and are then encouraged to dive deeper with more advanced materials. To that end, I would like to develop and teach advanced courses in line with my research activities in the area of nanomaterials and sustainable energy.

As we do not expect students with different scientific backgrounds to quickly learn in a single way, my teaching strategy will combine a variety of approaches, including lecture, demonstrations, discussion and collaborative activities. I have had many opportunities to mentor undergraduate and graduate students as well as postdocs participating in my research programs. At the **University of Sidi Bel-Abbes** – Algeria, I gave numerous lectures in electronics engineering to a group of 60 graduate students. I also demonstrated electrical measurements laboratory experiments to an even larger number of graduate students. At the **University of Houston**, I worked as a supervisor and a mentor with students and postdocs in doing research outside of the classroom and disseminate their results to the scientific community. As a visiting Professor at the **University of Tabuk** - Saudi Arabia, I taught the following courses: General Physics 1&2, Quantum Physics 1, Electromagnetism 1, Thermodynamics, Radiations and Diagnosis, and Electronics Labs.

I am highly motivated to impart my skills and knowledge to both graduate and undergraduate students and look forward to engaging them directly in my own research activities. **Actual courses will be developed in response to the need and curriculum of the school. I also feel qualified to open and teach the following specialty courses in my areas of expertise:**

1. Nanomaterials

Basic principles of synthesis methods, processing, and characterization of unique properties of materials built at the nanoscale. This course covers nanostructured materials (i.e. nanoparticles, nanowires, quantum dots, and thin films), transport properties, and applicability of these nanomaterials.

2. Nanoscale Energy Technology

Nanotechnology holds the potential to drastically change the concept of energy in the world. This course examines how nanotechnology meets the many challenges of science and technology to produce innovative and sustainable energy. Topics include the role of nanotechnology in improving solar conversion, fuel cells, electrochemical batteries/ultra-capacitors, power generation and conversion for both renewable energy resources.

3. Advanced Materials for Energy Storage, Generation, and Conversion

Focus on green energy enabling materials produced at the micro- and nano- scale for energy storage, generation, and conversion, including electrochemical batteries/ultra-capacitors, fuel cells, energy harvesters, photon converters and photo-catalyzers.

4. Computational FEMs in Nanotechnology

Introduce the key concepts of computational finite element methods (FEMs) and their applications to nanotechnology. Include hands-on training sessions using commercial COMSOL software to run multiphysics modeling and simulation. Cover cutting-edge research and development for sustainable energy resources using COMSOL.