Teaching Philosophy: Coming from a small town in India and now working at one of the prestigious laboratories of United States has been an interesting journey. In this journey, I have realized the importance of good mentoring and teaching. I found that dedication and adaptability are the prime skills of a mentor for scientific, intellectual, and professional developments of undergraduate and graduate students. As an educator, it is our responsibility to remove scientific misconceptions, develop curiosity, and foster creativity among students. This is the motivation behind my passion to be a good teacher.

Therefore, my philosophy of teaching focuses on the educator's ability, adaptability, desire to engage students, mastery of subject matter and the skill to present in an understandable way. I identify two major themes in my teaching philosophy:

1. Educator's ability and skills to identify those students lagging and engage them actively to raise their prerequisite knowledge.
2. Learning is a reciprocal process; student and teacher can learn from each other and benefit themselves. An educator must be willing to learn how to adapt their teaching styles to accommodate students from diverse backgrounds. Teaching needs to evolve based on need and students' responses.

Teaching Experience:

My teaching experience began as teaching assistant (TA) at University of Utah, continued throughout my postdoctoral position and in my current position. During graduate studies, the teaching assignment responsibility were; 1) introductory laboratories, 2) an advanced laboratory for STEM majors; 3) an advanced undergraduate laboratory. All these assignments had four parts: 1) 30-minute lecture about the experimental methods and underlying physics, 2) helping students to conduct experiment and to analyze data, 3) grading lab-reports, 4) and office hours for specific questions. As a postdoctoral researcher, I trained and co-mentored undergraduate and graduate students in their research.

In this teaching journey, I found via individual conversation that many students were having difficulty to understand why they are doing the experiment, what physics they are going to learn from the experiment and how that knowledge benefit themselves. After talking to them, I quickly learned that these students were lagging in prerequisite knowledge due to several reasons. So, I immediately engage them by real life examples and background basics knowledge that they need to know before doing the experiments. I found that this method was helpful and students welcomed it.

Teaching strategy:

Students find it difficult to relate classroom teaching with hands-on laboratory experiments because most of the experiments are already setup for collecting data. This structure allows to conduct many experiments over a short period-of-time, but it takes away real-life experience of encountering and overcoming unforeseen obstacles during designing and building the experiment. The ability to design and build an experiment from the ground up is a skill that will help students to build confidence and to educate themselves systematic approach for problem solving. My strategy will be to add a small project at the end of the laboratory courses. In this project, each student or group of students will design and setup the experiment, take the data and write a report about their finding.

During several discussions with students and colleagues who taught traditional physics class, I came know that many students had difficulties to understand classroom materials. I feel that this is because students come from diverse background thus different levels of basic knowledge. As a teacher, my strategy will be to transform a class of diverse background knowledge into a class of uniform level of

knowledge. Therefore, there will be many students who will need extra coaching from an educator to catchup with rest of class. Normally, these students get help during office hours but due to various commitments not every student get help during office hours and it is simply impossible to teach larger number of students during short office hours. There is two ways to solve this problem; 1) provide a non-credit classroom teaching for undergraduate students, and 2) technology can bridge the path to provide teaching 24x7 for those who have needs. My strategy will be to combine both the methods. First, I will identify prerequisite knowledge needed for several entry level undergraduate physics courses and that prerequisite knowledge will define the syllabus for non-credit classroom teaching. Finally, I will audio and video record the non-credit classroom teaching for future use as an online teaching materials. This strategy will have two advantageous; 1) because of non-credit nature there will not be any grade and tuition fees therefore, students will be more enthusiastic to participate, and 2) online version of it will help students who not able to join the class. I feel that a method like this is not disruptive to the currently established teaching methods and would greatly enhance the student's learning experience.

Teaching interest:

As an experimentalist, I enjoyed teaching many experimental approaches in laboratory courses. These laboratories are critical for physics major as students get hands-on experience about different experimental techniques. If opportunity comes, the experimental courses that I am interested to teach are; 1) Intermediate Physics Laboratory, 2) Instructional Laboratory Techniques in Physics.

For traditional classroom teaching, I would love teaching classes; 1) General Physics, 2) Quantum Mechanics, 3) Electricity and Magnetism, and 4) Solid State Physics.

I also would like to introduce new topics that I have learned throughout my research experience including magnetic resonance (NMR & EPR) and scanning probe microscopy (AFM). These new courses will provide students a comprehensive idea about the forefront of research and developments.

Assessment:

I would assess my teaching goals through standard grading methods as well as judging enhancement of student's confidence and knowledge in the subject matter. Student's performance will be recorded using standard exam methods and self-assessment. I will set up an online feedback mechanism where student can send feedback as well as questions they might have regarding class materials. This interactive online feedback system will help me to draw a baseline for the next lecture and I will discuss all the general questions asked by student so that every student will be on the same page. The next step would be to actively engage myself to identify those who need extra care and help them with supplementary teaching materials. Finally, I will compare the performance in the exam with past exam to measure effectiveness of my teaching method. If found to be effective, this method can be replicated in many semesters and perhaps this will become a popular method to use among others.