

## **Dr. Stavros Christopoulos - Teaching Statement**

### **A. Teaching Philosophy and Methods**

Physics is in the heart of everything. Every time we endeavor to comprehend the origin, the driving force and the causality of the phenomena that surround us, we discover that physics lies therein. Even more substantially, it is this understanding that provides the necessary tools for the development of our technological civilization. It is also intrinsic in the nature of this process that we develop a critical thinking and thus equip ourselves for any future challenge. Hence, it is apparent, that the importance of Physics studies is vital not only for Physics major students, but also for all future scientists and engineers.

To begin with, it is absolutely crucial for me to create an inclusive environment for the students. Everyone has to feel accepted and comfortable while in the classroom and not hesitate to ask any possible question regarding the material. For those who have extra questions, I also provide additional visiting hours so we can find solutions to their problems. Furthermore, I create opportunities for group activities, which are either discussion oriented or problem-solving, so that an environment of solidarity and collaboration is quickly developed among the students. Learning styles, differentiation and active learning are pivotal to my teaching and learning philosophy.

Regarding my teaching methods, I use a plethora of different approaches. All the material is provided in slides so that the students can print them out before the lecture, or use their tablets to make the necessary notes. I also solve many characteristic problems regarding each topic of the material so that the students can better comprehend its particularities. Furthermore, it is quite substantial that all topics are tightly connected to technological applications, either devices or industrial methods, so that the students can cross-correlate the knowledge they receive as well as solidify it. While teaching, I encourage constant interventions and lead stimulating discussions in order to determine the depth of their understanding and consolidate it. Teaching is, after all, a constant dynamic equilibrium, where the instructor's role is to elevate it to the highest level.

The scientific process can be quite fascinating and students can be undoubtedly inspired by it. To this end, I am making many historical references during the lectures, regarding certain scientific challenges and the way physicists tackled with them, giving also emphasis to the background and perception of science that prevailed at the time. In this way students nurture a new appreciation for critical thinking, which can be further stimulated during the lab sessions of each course as they, in turn, face both theoretical and technical challenges, when trying to determine various physical quantities. During those lab sessions I urge them to comment on the difficulties they faced, interpret their results, compare them with the expected values and make conjectures regarding the cause for the possible differences. A written report is also required after each lab exercise, so that they can develop their skills on scientific writing, which involves being clear, concise and consistent.

For the most advanced classes, I organize scientific discussions and presentations, where each student thoroughly elaborates on a scientific topic of their own choice. This has proven to be an invaluable tool, since students have the opportunity to consolidate their knowledge on certain scientific subjects as well as practice their speaking in public, which can frequently be a stressful and uncomfortable issue for some of them.

I hold equally important to include during each course various forms of formal assessment such as problem-solving, midterm tests and of course lab reports, through which I can establish the depth of the students' comprehension and work on the difficulties they are facing in real time. On the other hand, I frequently ask their opinion on my teaching approach and utilize this feedback to improve each year. Learner feedback is of paramount importance to me.

It should be noted that I perceive the work of an educator as one of particular importance, since it is tightly connected with the future of the students that entrust them. Through the critical thinking and inquisitive spirit that they develop, as well as the scientific knowledge that they acquire through our collaboration my students reward me every day with their accomplishments, establishing my contribution towards a scientifically literate society.

## **B. Teaching Experience**

My experience in teaching is quite substantial. During my undergraduate and graduate years I worked as a Physics, Mathematics and Chemistry tutor in Greece. As a PhD student, I had the opportunity to work as a Lab Instructor, Teaching Assistant and a Marker for undergraduate Physics major students at the University of Southampton.

During 2011-2013 I worked as a Lecturer at the University of Nicosia with a teaching load of 9 - 12 hours per week. I taught not only introductory courses such as Newtonian Mechanics and Electromagnetism, but also Waves, Optics and Thermodynamics, for which the entire responsibility for the curriculum, lab demonstration and marking was my own. Apart from my notes, the books used for instruction were *Fundamentals of Physics*, by D. Halliday, R. Resnick and J. Walker, and *Physics* by D. C. Giancoli.

During 2013-2016, due to my role as a Senior Scientist at the University of Bonn, I supervised 1 undergraduate, 7 Masters and 1 PhD student. I directed their experiments, instructed them how to overcome technical difficulties and advised them during result analysis and the writing of their thesis and final presentation. I also taught for two semesters the “Advanced Topics in Photonics and Quantum Optics” course which was available for Physics graduate students.

Finally, during 2016-present, as an Assistant Professor, I have been teaching Newtonian Mechanics, Electromagnetism and Optics using a university approved material on slides. My minimum teaching load has been 12 hours a week. The books of instruction are: *Matter and Interactions*, by B. A. Sherwood and R. Chabay, *Physics for Scientists and Engineers*, by P. A. Tipler and G. Mosca and *Optics* by E. Hecht.

To conclude, I would like to note that I am very interested in teaching introductory, intermediate, but also advanced Physics courses, with a preference on Lasers, AMO and Material Physics, as possible due to my extensive research background.