

Teaching Statement

Alaa Khalifa

The opportunity to meet and interact with young and bright students, most of whom are at the threshold of entering the real world, is one of the advantages of academic life. It gives me great pleasure and happiness that I will have the opportunity as assistant professor to take part in the initial stages of their journey. This will also provide me with a platform to develop my skills in terms of both presenting myself and being a great source of research ideas. Below, I summarize my teaching experiences and ideas:

Previous Experience

I had the honor of becoming an assistant professor for courses for Mechatronics and Robotics. These courses allowed me to teach a few classes as well as play an active role in setting up assignments/exams and grading them. My experiences for such classes as an assistant professor are as follows: A) When pictures/movies are used during teaching, students become more receptive throughout the lecture. Relevant video clips, for example, will help to show the broader image of the kind of futuristic systems we would be looking at in a mechatronics and robotics class. (B) In the Advanced Mechatronics and Robotics courses, students were brought on a field trip to a plant or laboratory where a number of practical robots were worked. It stimulated much discussion in the classroom, with several students showing interest in engaging in similar projects. (C) Another important thing that I have found is that students feel really related to the topic if the topic/field context is made clear or efforts are taken to link the topics with common practical life.

My office hours have helped me to communicate individually with the students and get their views on various issues. For example, I was surprised to find that many students actively look at lecture slides before the lecture, more than I had anticipated. According to this experience, I must make sure I have my teaching slides accessible in advance. Another lesson I learned, the hard way is grading can be a contentious issue if the grading scheme is not made clear in advance. Students are much happier if a detailed marking scheme is provided in an exam for each question, rather than a coarse assessment. Many of the finer aspects which could not be explored explicitly in a classroom come to my notice through individual interactions. When I teach courses, I want to turn all this useful experience into action.

Teaching philosophy

Mechatronics and Robotics is a practical field. Based on my own experience and through students' reviews, I agree that students should have hands-on experience in constructing small systems or working through problems rather than just the theoretical study of the topic. The effect of practical interaction tends to continue for a much longer period of time. I wish to keep my courses flexible as well. For example, students may have the option to pursue a larger project, rather than multiple smaller ones. Considering the subjective nature of project evaluation, I should be paying particular attention to the assessment criteria. I would like to evaluate my students through assignments, projects, and quizzes gradually over the semester, rather than just through tests. Tests can fully be substituted in more advanced courses by writing a research paper or a large project.

As the world is progressively networked, the role of a conventional method of teaching could be decreased to some degree. However, an instructor would still need to play the main task of inculcating interest in studying the different ideas and strategies and demonstrate the joys of discovering the specific subjects without inherently relying on end results. I will be having my classes interactive to promote this. I will also introduce discussion sessions on open-ended topics. I would still like to invite visiting lecturers or, if possible, do a field trip for my courses. Finally, I should make sure my grading scheme does not penalize students for performing more exploratory research rather than a result-oriented task.

Although supervising undergraduates can often entail a lot of effort, I believe that it is well worth the effort since undergraduate research is a very important aspect of a student's life and it often yields new prospective graduate students or research contributions. When teaching graduate classes I always strive to dedicate the last minutes of the lecture to explaining the current research frontiers in the field, and if possible, mention some of the most prominent open problems.