

Soheil Eshghi

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Teaching Statement

Classroom Teaching: I have served as a teaching assistant to two semester-long graduate-level classes as a PhD student at Penn on Fourier Analysis and Digital Signal Processing, holding weekly recitals and designing and grading homework and exams. As a postdoctoral associate at Cornell, I served as a teaching assistant to a graduate class on Markov Decision Processes, designing and grading homework and exams, as well as teaching some sessions of a graduate-level class on Digital Signal Processing as a guest instructor. This is in addition to my experience as a teaching assistant 4 semester-long courses (on Electrical Engineering Principles, Digital Logic Circuits, Analog Circuits, and Computer Structure) and as a lab assistant in 1 semester-long course (on Microprocessors), in each of which I held weekly recitals and graded homework, during my time as an undergraduate at Sharif.

Teacher Training: During my PhD at Penn, I completed a 3-month college teaching workshop¹, where I cultivated skills based on the latest research in active learning and classroom participation methods, while also being evaluated in a real classroom scenario. This workshop gave me the vocabulary to describe the differences that I had perceived in the methods of my teachers and the outcomes of my own TA-ships. At Cornell, I noticed how teaching extends beyond the classroom, and how a good instructor should also be a capable mentor. For that purpose, I completed a 6-week workshop on mentoring², where I learned to align goals and maintain a supportive relationship with mentees and developed the skills to have frank, difficult conversations when necessary. Finally, to improve my communication skills, I completed a 6-week workshop on science communication at Yale³ with Bob Bazell, former chief scientific correspondent for NBC News, where we focused on communication styles, on the use of verbal and physical cues to keep audiences engaged, and on thinking deeply about the audience and their understanding when preparing material, culminating in a 10-minute TED Talk for a lay audience. These workshops are a counterpoint to my hands-on experience as a teacher, teaching assistant, and lab assistant.

Teaching Philosophy: As a teacher, rapid feedback, self-directed learning, stories, and clear communication are my 4 key tools in creating a successful learning environment. The success of such an environment depends upon continuous reinvention and retooling on the part of the educator.

A particularly successful method I encountered as a student that I have co-opted, is testing course material before and after it is taught in class to incentivize self-directed reading of course material. This is a necessary skill for students who will interface with primary technical documents daily. Collaborative homework projects also serve the same purpose; simulating the necessity of collaboration in professional environments. Long-term projects also give students exposure to team-work, conflict resolution, and leadership, while simultaneously fostering deeper

¹ <https://www.ctl.upenn.edu/ctl-mini-courses-college-teaching>

² <http://gradschool.cornell.edu/cu-cirtl/mentoring-program>

³ <http://ctl.yale.edu/event/expressing-your-enthusiasm-oral-communication-workshop-stem-graduate-students-and-postdocs>

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learning and longer-term retention of course material. The role of classroom teaching, in my opinion, is to augment such processes for deeper learning, and not to replace them.

In my experience, stories have been very helpful in contextualizing knowledge and providing an on-ramp for recall. This enduring recall is what I aim for students to take away from my classes, serving as an entry point to the process of relearning specific topics that they may require, but will have forgotten, later in their career. The historical narrative behind the development of technical concepts also humanizes research, providing opportunities for engaging the curiosity of students who may not yet be as experienced or as interested in mathematics. In developing course content, I have observed a “zero-based” curriculum approach (as employed in a course I TA-ed), which evaluates topics for inclusion based on their current relevance and core importance.

I believe in continuous evaluation of the instructor and the course, as well as that of students. As a student, high-volume low-consequence evaluation has been a key indicator of courses I both liked and learned from. This allows students with different learning styles to succeed on their own terms (e.g., through picking a marking regime suited to their strengths). I strive to measure student engagement through frequent questions, as well as voting mechanisms for general feedback (e.g., using clickers), in accordance with the Active Learning methodology.

Clear and continued communication is key to a positive educational experience. I have observed that aligning expectations early removes ambiguity and prevents conflict. Clear communication channels also allow the instructor to obtain one-on-one feedback from students and to provide targeted assistance.

In sum, as an instructor, I will employ stories to put knowledge into context, frequent testing to adapt course material to student understanding, and nudges to incentivize self-directed learning, while maintaining clear communication channels and seeking to adapt to changing student needs.

Courses: I would be delighted to teach undergraduate and graduate courses in network science, electrical engineering, optimization, and operations research, especially around control systems, mathematical modeling, communication networks, and digital signal processing. I aim to develop a curriculum for a course on control of networked systems, based around applications of centralized and decentralized control methods applied to the control of epidemic processes on networks, as well as a more technical course PhD-level course focused on optimal control methods and a multidisciplinary course around the spread of information, pulling together threads from economics (social learning), network science, and psychology.

Mentoring: In addition to my training, I have helped more than 10 undergraduate students with graduate school applications and more than 20 graduate students with preparation for management consulting interviews and have led a series of 6 extra-curricular interviewing and networking workshops at Cornell as a leader of a campus student organization. I feel personally invested in the successes of my past mentees and students within and outside academia, helping them to articulate and reach their own career goals. Fulfilling that role on a more significant scale is one of the main draws of academia to me.