TEACHING STATEMENT

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My teaching philosophy is closely related to the reason why I decided to pursue an academic career in mathematics. I always have seen academic work two-fold: Produce new knowledge and to educate a new generation to produce even better knowledge. For this reason, I value teaching as well as I value research. In my six years at the University of Toronto, I worked **as a teaching assistant, a course instructor and a course coordinator.** Each of these experiences nurtured me and turned me into a great teacher. I also participated in the Mentorship Program where I worked with high school students on research level mathematics. In this statement, I will try to explain what I learned from each of these experiences. **In page 3**, I also include an example of my True or False method.

As an undergraduate student, I took several courses from several professors from several different departments. As a graduate student, I have been to several international conferences and chatted with several world experts in their areas. I have observed that there are two types of teachers: the ones you would not mind having a coffee with and the ones you would not want to have a coffee with. Hence, the first thing I aim to do at the beginning of my lectures is to create a safe environment to have a mathematical discussion in the classroom. By this, I mean three things: **students should not fear that their voice will not be heard, students should not fear that they might be wrong, students should not fear that the teacher will judge them.**

I "*create an environment so that even the most reserved students feel comfortable contributing*". This quote and the following are written by my students when they nominated me to the university-wide Teaching Excellence Award. "*His attitude towards learning with other people, respecting their proofs and mistakes, etc. is contagious also and has made it much easier for me to work with people even when not in tutorial*". I actively encourage every underrepresented group to participate in the discussion and create inclusivity. This becomes a natural task when one acknowledges and reflects on any potential unconscious biases. It is a fact that our society has underrepresented groups and we are nowhere near our potential as we do not always hear the best possible ideas. As an academic, **I strive to educate myself, be honest, acknowledge my privileges and most importantly, listen to the voices who raise these issues.** In my classes, I actively promote events celebrating the achievements of underrepresented groups as I believe that representation is important.

I care about **mental health and accessibility** issues. In that, I make sure I can provide necessary accommodations to the students who need them. When I coordinated a course of five hundred students with twelve tutorial sections, I asked my teaching assistants to bring up any such issues to me. As a result, we were able to provide an alternative quiz time for one student who preferred typing up their quiz solutions on a computer. This student visited me in my office every week and they wrote the quiz on a computer.

During my undergraduate years in Turkey, I attended a lot of summer schools in Nesin Math Village. I learned a lot from Ali Nesin, the founder of the village and the winner of 2018 Leelevati Prize. For one, I learned **not to try to solve a problem.** Indeed, this is almost every student tries to do when they are asked a question. Instead, I learned from Nesin that one should attempt to understand the problem. At least in undergraduate level, once the question is fully understood, the answer jumps out of the book. The solution is very natural after understanding what the problem is. So, in every problem set I create I try to divide questions into several parts where they start with making sure they know all the definitions and

seeing examples/counterexamples before attempting to solve the question. Warming up students like this works well as it allows them to better understand what the question is asking.

As a teaching assistant or a course instructor, I learned how to encourage students in the classroom or during office hours. **My biggest learning experience came from courses that I coordinated.** In one case, I coordinated three instructors and ten teaching assistants in a course of five hundred students. I learned that in order to achieve my learning goals, I need to make these goals accessible to my fellow instructors and my assistants. It was a pleasure to lead such a group of teachers. I visited my assistants in classroom activities and not only did I give them feedback on their performance, I also saw where I can improve myself as a coordinator and also a teacher. I thought a lot about the best way to prepare a reasonable syllabus, an evaluation system which works best for different types of courses and how to encourage my assistants to work well together. I understand the value of teamwork in **teaching large classes.**

At the beginning of each semester, I encourage my students to keep a diary of their thoughts, feelings and ideas about the course and the course material. This is one of the most efficient ways to observe the progress one is making. If one can go back in time and see how challenging a concept once was, then one can appreciate how much they learned over the time. Being able to answer all the questions that you had three months ago about the course shows how much you improved in this time interval. In fact, most questions one has at the beginning of the semester seems trivial once one understands the question and thus the solution. But that triviality is the indicator of understanding. This is why I always keep in mind the following philosophy: **"There are no trivial questions. Every question is nontrivial until you understand the material and every question becomes trivial once you understand."**.

The Outreach Office at the Department of Mathematics offers a Mentorship Program every year. Within this program, graduate students, postdoctoral fellows and faculty members volunteer to have a semester long project with a high school student. I participated in this program for two years. In my first year, my mentee prepared a project on algebraic graph theory. With weekly meetings, she was able to follow a chapter of a graduate level mathematics book on the subject and prepare a poster presentation. In my second year, my mentee was able find his own research problem in representation theory after a month of weekly meetings. This program allowed me to improve myself as a mentor. **I am able to mentor an undergraduate student or even a master student in a research project.**

My methods and philosophy which I summarized above were also recognized by my department and my university. In 2017, I won a **Delury TA award** in the Department of Mathematics. In the same year, I was also shortlisted for a **university-wide teaching excellence award.** I was one of the 12 short-listed candidates among 201 nominations in a university with a student body of 80,000.

Every level of teaching is important and has its own nuances. I have great experience in teaching in many levels and I am determined to improve myself in every way I can. I always remember that teaching is a part of my idea of academia and I strive to do my best.

True or False.

One method I use to engage students in discussion is to ask True or False questions. **Instead of writing a theorem on the board, I dissect its proof into several true or false questions.** I allow students to think about the question and take a vote. For example, if we are learning differentiation rules and trying to prove the product rule, I ask them

1. **T or F.** For any two functions f and g, $\lim_{x\to a} f(x)g(x) = \lim_{x\to a} f(x) \lim_{x\to a} g(x)$.
2. **T or F.** We have $\lim_{x\to a} f(x)g(x) = \lim_{x\to a} f(x) \lim_{x\to a} g(x)$ IF $\lim_{x\to a} f(x)$ and $\lim_{x\to a} g(x)$ exist.
3. **T or F.** The function $f(x) = x^2$ is differentiable at $x = 1$ and $f'(1) = 2$.
4. **T or F.** The function $g(x) = x^3$ is differentiable at $x = 1$ and $g'(1) = 3$.
5. **T or F.** The function $h(x) = f(x)g(x) = x^5$ is differentiable at $x = 1$ and $h'(1) = f'(1)g'(1) = 6$.
6. **T or F.** If $h(x) = f(x)g(x)$ and $f'(a)$ and $g'(a)$ exist, then $h'(a) = f'(a)g'(a)$.
7. **T or F.** $h'(a)$ exists if the limit

$$\lim_{x\to a} \frac{f(x)g(x) - f(a)g(a)}{x - a}$$

   exists.
8. **T or F.** For any real number z, we have $z + 0 = z$.
9. **T or F.** For any real number r, we have $r - r = 0$.
10. **T or F.** For any two real numbers z and r, we have $z + r - r = z$.
11. **T or F.** $f(x)g(x) - f(a)g(a) = f(x)g(x) - f(a)g(x) + f(a)g(x) - f(a)g(a)$.
12. **T or F. WITH THESE HINTS I CAN FIND THE PRODUCT RULE ON MY OWN!**

At this point, I stop and give the students some time to go back to the definition and find the product rule on their own if it is a proof based course. If not, I go ahead and show them the product rule by completing the proof myself.

In these 12 questions,

1. I remind students the product rule for limits.
2. I show students that the product rule for differentiation is not *that* nice.
3. I give students basic ingredients that goes into the proof.

In practice, there are three options to vote: True, False, I don't know. If there are enough people who voted the third option, I stop the question and go back to explain the problem. I use **an online platform to collect the votes.** Introducing this technology in classroom increases the number of votes I receive in each class and the effectiveness of this method. This encourages the students to participate without fearing they may be wrong or they may be judged.