As a teacher, my most obvious obligation with my students is to communicate the material and teach them how to learn it. But I am also the one showing them where my class fits in their education, the one who creates a welcoming classroom environment where everyone has a chance to grow, the one who knows each student’s goals, the effort they put into them, their strengths and flaws. Being aware of all this, I continuously ponder different ways to fulfill these teaching goals, adding to my ever-evolving philosophy of teaching. The following paragraphs describe some of the core beliefs that my years teaching at Rutgers have yielded - beliefs which, at this point, I expect to remain with me for the rest of my career.

**Active learning**

Learning happens when doing, not observing. I was once the teaching assistant for a Calculus class in which I never assigned in-class activities, while the instructor never assigned homework. As a result, most students believed they knew the material well, from only having listened to us talk about it, but did poorly on the exam. Since then, I started finding ways to include active learning activities inside my lectures and recitations, primarily through problem sessions where I encourage the class to think out loud, compare answers, and present their solution to the class. Group work often is a mandatory part of these sessions, as I have observed that students benefit from the opportunity to explore a problem together and especially to debate their solutions with others.

Those who attend my office hours know that they cannot expect me to simply give them the answers. I consider it important to first ask them what they have tried (sometimes they haven’t) and build the solution together with them. They are much more likely to learn from a problem if they had a part in coming up with its answer. I also find that a session of office hours conducted this way with three or more students naturally becomes a group work session (which they always seem to consider useful).

Taking notes from the professor’s board work in class is a form of active learning, so I encourage my students to do so by refraining from using slides. Reviewing those notes and creating one’s own study guide is more efficient than using materials prepared by the professor, so I refrain from making my materials available too early in a course (at least until enough time has passed that everyone has had ample time to create their own study materials). Many little tweaks like these are always in my mind to ensure that my students will not end up unwillingly having only a passive learning experience.

**Systematic before conceptual understanding**

I classify a student’s level of comprehension as *systematic* when he or she is capable of replicating the problem-solving techniques taught in class, but not of explaining how they work or adapting them to a different context. This latter set of abilities (labeled *conceptual*) is indispensable when the student is learning proof-writing and mathematical reasoning, but I also regard it as the ultimate goal in lower-level, computation-heavy classes. The trick is that it takes time to develop.

In 2017, I taught a Probability class in which I tried to create both conceptual and systematic understanding side-by-side, by showing a natural flow of ideas leading to the algorithms and formulas of each topic. I wanted everyone to understand the workings of each abstract topic already at their first time seeing them. It was a mistake. Students were simply confused about what they were expected to reproduce in exam questions - where the formula actually was in all that rambling. I now believe that the systematic side (application of the correct algorithms to typical problems) should happen first, independent from conceptual motivations. This initial hands-on approach gives everyone a chance to themselves form a concrete image of the subject, paving the way for thinking about it conceptually later. Most recently, I’ve had success with this approach in Linear Algebra: it was easier to have the students think about the various properties of a matrix after they had already become proficient in Gaussian elimination through dozens of examples.
This idea also guides my approach to teaching theorems in higher-level classes: the statement and applications come first, but the formal proof only comes after these applications have already demonstrated the typical properties of the objects at hand and rendered the proof idea natural. Admittedly, I still do not have much experience with teaching this kind of higher-level material, so I look forward to further testing and evolving this approach to it in the future.

Mathematical writing

I tell my students that their homework solutions must read like a short essay: they should contain text following a logical argumentation. With this, I hope to convince them that problem solving in Math, not unlike in other areas, entails critical thinking, understanding of assumptions, compelling presentation. Too often, students make it to college (and out of it) lacking the skill of clearly organizing abstract ideas on paper, even when they actually have the conceptual understanding of how it all works. While the importance of this ability is clear for Math majors who must learn to prove theorems, it is just as important for the other students in any Math class, because effective communication is necessary regardless of what career they are preparing for.

But I should also stress that I actively try to differentiate lack of clarity from lack of fluency in English. International students sometimes produce writing with grammatical errors, but as long as this does not interfere with the clarity of their ideas, I pay no attention to it. I am not a native speaker myself, and yet my students can see that my having an accent and making occasional English errors does not get in the way of communication, which I think helps motivate the more reserved students to participate in class and engage in group work. I also understand the difficulty of producing elaborate writing in timed assignments; hence, for quizzes and exams, my expectation for their work reverts back to the typical: calculations spread over a blank solution area and a circled final answer.

Individual focus

I have taken tutoring jobs and volunteered as a mentor in my department’s Directed Reading Program, which pairs up undergraduates wanting to learn more about topics of their choice with PhD students who can guide them. These activities consisted of weekly in-person meetings with one student at a time, quite different from the experience of lecturing to a full class. From talking to them during these meetings, I became aware of the different forces that drive their will to learn (or to just pass a class) and of what is usually expected that they retain from a Math class in each career path. This motivated me to start giving out homework zero to the students in my regular classes, at the beginning of the term, with questions about their background, courses currently taking, reason to be in my class etc. It gives me a picture of the class as a whole, making it clear which gaps in understanding I need to fill and how to make the material useful and/or enjoyable for most of the class. It makes a difference in the students’ attitude towards learning when they see that their instructor wants to get to know his audience and tailor the contents to their needs.

Having the data in homework zero available at all times is also useful when I need to meet with a student in private. This way I can better understand their troubles with the material and be prepared for the occasional questions about Math in general. In particular, I’ve had undecided students ask me countless times about graduate school and research in Math, and I’m always happy to aid them in deciding whether it is the correct choice for them.

The chance to teach a subject that I always loved is a big part of the reason why I decided to thread the academic path. Teaching at Rutgers and discussing it with my colleagues here have only reinforced my wish for my career to be involved with it, while hearing my students’ feedback has only added to my suspicion that I am good at it. At the same time, knowing that no statement of teaching philosophy can ever be considered final, I look forward to crossing paths in the future with good educators whose opinions I can add to the larger version of this document that is perpetually in the back of my mind.