

I never thought I'd go to college. It wasn't an aspiration that kids at my school had, nor my family, but in my third year of high school, a physics teacher helped me see that I could achieve great things. He gave me the flexibility and trust I needed to learn. He was the first to pick up that my low performance on traditional exams wasn't due to a lack of skills or commitment but to everything I had to manage in an unstable home. He saw my potential and proactively invited me to an extracurricular laboratory he ran so that I could learn through experimentation and forget about things outside the class. Further, rather than being assessed in an environment that was counterproductive to me, he suggested that I take the exams at a more convenient time and not right when I had arrived at school from home. These changes in my learning environment motivated me to focus on my strengths. Through these actions, he displayed care in my thriving inside and outside of the classroom.

Since then, I've come to see teaching as guiding and mentoring others on their life and learning journeys, as I see education as the utmost opportunity to grow and serve those we care about. I have also strived to help my students and mentees grow in:

1. Self-efficacy and self-awareness by teaching not only content but also teaching how to learn.
2. Rigor and strategic learning by teaching to probe the building blocks of knowledge.
3. Versatility and pragmatism by teaching to engage scientific knowledge from theory to novel ways it could be applied to the world and systems around us.

Self-efficacy and self-awareness. Students come to my classes with different backgrounds and knowledge frontiers. I guide students to see learning as a process where we connect a set of building blocks leading to new knowledge, and I prompt them to recognize their unique starting points so that we can together fill the gaps and walk towards new horizons. I guide students to push their boundaries by breaking complex problems into simpler parts. I also use diagnostic surveys at critical points in the course to assess my students' progress, for them to practice awareness of their learning journey, and to evaluate my teaching. These strategies help me better serve learners with diverse strengths, for example, theoretical, practical, experimental, or argumentative strengths.

Rigor and strategic learning. For my classes, I focus on student-centered intended learning goals and work backward from these goals to identify the necessary methods to accomplish them. For example, if the goal is to be able to select a machine learning task to address a problem, before that, we need to identify the building blocks that would allow us to succeed at selecting a task: we need to know how to define a task, what are the most common tasks, how flexible these are, what they mean, how to evaluate them, and what problem each task solves (e.g., classification, regression, ranking, clustering, among others). Further, when students ask a question, I probe to identify the real root of their inquiry. This probing strategy coaches students to learn how to understand their own knowledge gaps and how they can fill them independently. It also helps me to surface my students' knowledge gaps and various learning styles to prepare my lectures and celebrate different ways of understanding a problem.

Versatility and pragmatism. In engineering school, majoring in computer science, I discovered my passion for teaching and had the opportunity to develop my teaching through more than fifteen teaching assistant (TA) appointments and later working as an adjunct professor. Computer Science and Data Science require a balance of theory and practice to achieve state-of-the-art solutions. These fields offer vast dynamic opportunities to hypothesize, test, and apply concepts in real-world scenarios, which I reflect on in my classes through examples and projects, ensuring students leave with a deeper understanding of how to tackle real problems with their new skills.

As an adjunct professor at Pontificia Universidad Católica de Chile¹, in 2017, I taught Computer Science courses, including Data Mining, where I designed a curriculum that would embody my guiding values. I structured the class with two modules per week; one was dedicated to the theory where I started with a real-world challenge, and used active learning techniques to prompt students to first hypothesize with their seatmate about how to approach the problem, then share with the class, and then move from there after students felt empowered to brainstorm solutions to problems they hadn't thought about before, aware of how their solution agrees with or differs from others', and appreciative of the different perspectives everyone would bring to the class. The second module was dedicated to from-scratch implementation of the theory we had just studied. This approach led to greater student excitement, more substantial project outcomes, and higher participatory energy in our classes as students built these models. For this, I received the School of Engineering's 2018 award for Exceptional Quality as Lecturer and Maximum Student Satisfaction. In 2018, I also taught the Advanced Computer Programming course, which I had co-designed in 2015

¹ Ranked top 1 in Latin America: <https://www.uc.cl/en/news/uc-chile-is-the-best-latin-americans-university-for-2022/>

as a Lead TA. For this, I received the School of Engineering's 2015 Award for Exceptional Teaching Quality. This work culminated in an open-source book², where I was acknowledged as the primary contributor for my extensive code and content contributions.

My teaching experience has also led me to be part of and contribute to teaching communities, create teaching development opportunities, and develop skills to teach computer science and data sciences for diverse fields.

Contributing to teaching communities. Not only do I offer concrete resources to expand my lessons (for example, as in the release and maintenance of teaching resources³ at MIT or the open-source book above), but I have also enjoyed formal training for my teaching through the MIT Kaufman Teaching Certificate Program, a semester-long seminar in which we practiced evidence-based mechanisms to help students learn, with focus on syllabus design, assessment and metrics design, as well as having a micro-teaching session reviewed based on our empirical teaching strategies. Furthermore, I have led sessions on pedagogical strategies, developing syllabi, and managing TAs as well as an institute-wide training workshop for TAs in collaboration with the MIT Teaching + Learning Lab⁴. I also worked alongside MIT faculty advocates for pedagogical development in their departments as an MIT Teaching Development Fellow from 2021 through 2023.

Leadership in creating teaching development opportunities. Motivated to support my peers at MIT in developing their teaching experience coupled with my passion for bringing knowledge to those beyond MIT, in 2023, I led a 10-day research-focused program for graduate students in Chile, which hosted eight hands-on lecturers (half flying from MIT), covering topics from bias in machine learning to brain-computer interaction. For two months before the program, I worked closely with lecturers to set goals for their classes and practice strategies to accomplish them. I also led them to design pre-program assignments and reading material to prepare students' background knowledge. Lecturers saw the experience as challenging but highly rewarding. This program equipped lecturers with core scaffolding and active learning strategies, leading them to deliver—for the first time—their research not as a monologue but as an accessible and engaging student-centered teaching experience.

Machine learning for diverse fields. As a grad TA for MIT's Applied Machine Learning course in 2019, I mentored students from various graduate programs beyond Computer Science, including Chemistry and Earth Sciences. In 2020, as lead TA for MIT's Understanding Public Thought course, offered jointly with the University of Wisconsin-Madison, I led technical sessions and incremental formative homework assessments for Political Science students. Both times, in mentoring and leading technical sessions, I began by defining and illustrating a dataset, then inviting the classroom to brainstorm questions to explore concerning it, and then we motivated the choice of specific technical methods as those most helping us answer these questions. I gave them code that would solve parallel questions and invited them to modify it for their own questions. Students used these resources and skills to enhance the quality and rigor of their final projects significantly; students without initial technical knowledge produced work of publishable quality in computational social science.

Preparing students for future roles. The skills students acquire through proposing and implementing algorithms, working with large datasets, and engaging in complex challenges prepare them for tech industry and academic roles. In my courses, I assess students' ability to apply theoretical and technical knowledge to practical scenarios, for example, by presenting them with a real scenario or a dataset and asking them to implement, evaluate, and report a plausible solution. Additionally, written tests assess their understanding of concepts like performance evaluation and optimization techniques, ensuring they have a firm theoretical foundation. By using these varied assessments, I ensure that students are also equipped to apply their knowledge in professional and research settings.

Balancing high standards with a supportive learning environment. I hold students to high standards in both theoretical and practical assessments, as our field demands rigor and replicability. I work alongside students to meet these expectations, for example, by sharing the rubrics for their assessments in advance. I foster inclusivity by leading by example and celebrating different perspectives in classroom discussions. My commitment and dedication to supportive mentorship inside and beyond the classroom led me to receive an MIT Excellence Award⁵ from the MIT Office of Graduate Education.

Moving forward. I look forward to serving and inspiring more students as a teacher, improving and adapting to the newer generations of students, expanding my teaching approaches as new research and methods emerge, and pursuing academic excellence and innovation in STEM education.

² Open-source book: <https://advancedpythonprogramming.github.io/>

³ More resources: <https://www.media.mit.edu/posts/resources-from-the-teaching-development-fellow/>

⁴ MIT TA Days: <https://tll.mit.edu/programming/ta-days/>

⁵ Excellence Award: <https://oge.mit.edu/community-diversity/awards-recognition/celebration-of-graduate-women/>