Teaching Statement

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Statement of Teaching Philosophy

At Caltech, I have served as a teaching assistant for five undergraduate economics courses, ranging from proof-based matching theory to computational econometrics in R and empirical finance in Python. Much of my teaching takes place one-on-one: in office hours, through targeted email discussions, and in detailed feedback written in the margins of problem sets.

My teaching is guided by two core commitments: providing timely, specific, and actionable feedback, and training every student to construct and defend economic argument on their own. Over the same years, generative AI changed what students submit and how they look for help, prompting me to design learning environments where students actively engage rather than relying on automated answers.

Feedback is where most teaching happens. A deducted point merely signals an error; an effective comment pinpoints the exact step where an argument breaks down and explains how to repair it. I focus on this diagnostic feedback, returning assignments promptly so students can digest corrections while the problem is still fresh. I take the same constructive approach to regrades, treating them as teaching opportunities rather than a dispute to settle. When a student argues for points, they are actively grappling with the material. A student arguing for points is engaging with the material, so I answer with the economic logic behind the decision, not only the final decision.

Reaching every student, not only those who come to me. Many of my students arrive with strong math backgrounds but little exposure to economic thinking. For them, the challenge is rarely the calculus, but understanding why a model is set up a certain way, or what a proof actually says about incentives and behavior. I try to build on what they already know, constantly translating in both directions between intuitive economic logic and formal math. I also try to be reachable outside scheduled hours. When students cannot make office hours, I answer their questions in detail by email. Often, those struggling the most are the least likely to ask in person. I treat detailed written feedback and prompt email responses as practical ways to reach students wherever they are comfortable asking.

Teaching in the age of AI. Over these years of grading, I watched AI-written proofs go from fluent nonsense to increasingly correct answers that are similar across students. A graded problem set used to be both practice and a signal of understanding, because producing the answer required the understanding. Now the answer can be produced without it, and the grade stops carrying information. In May 2024, as an experiment, I gave the midterm of a hedge fund course to ChatGPT and graded its answers as a student's. It scored 88.5 out of 100 with answers mirroring student work. Educational research confirms this disconnect: in a large field experiment, high school students with unrestricted GPT-4 access scored 48% higher during practice and 17% lower on exams once access was removed (Bastani et al., 2025).

Rather than banning these tools, I will separate practice from evaluation, turning verification into an explicit skill:

- **Practice** remains low-stakes and open-tool, guided by clear norms: students make an initial attempt first, consult AI for clarification, and reflect on what changed in their reasoning.
- **Evaluation** shifts toward authentic demonstration through in-class exams, short oral walk-throughs of proofs, and conceptual justifications.
- **Verification** becomes part of the curriculum. In theory courses, students referee flawed AI-written proofs; in empirical courses, grading emphasizes identification and interpretation rather than raw coding syntax.
- **Office hours** prioritize what AI cannot replicate: identifying personal misconceptions, prioritizing critical steps, and critically auditing AI outputs side-by-side.

I do not use automated AI detectors in grading. Beyond their unreliability, they disproportionately flag non-native English writers (Liang et al., 2023). When work appears AI-generated, I highlight the unsupported step and invite the student to explain the underlying logic. This keeps the focus on the work, and ensures feedback remains constructive.

Richard Feynman's final blackboard at Caltech read, "What I cannot create, I do not understand." In an era of automated solutions, that principle guides my teaching: students may leverage any tool to learn, but they must leave able to construct and defend the argument on their own.

Teaching Experience

I have been a teaching assistant for five undergraduate courses at Caltech, spanning economic theory, econometrics, finance, and environmental economics, with 208 students enrolled in total. In each I held office hours, taught weekly recitations, answered questions by email, and graded problem sets and exams. On the four evaluation questions about the TA, students rated me 4.75 out of 5 on average, against a Caltech-wide average of 4.65 for the same questions and terms, and gave me a perfect 5.00 on all four in two courses.

Ec 122 Econometrics (Fall 2023). The required econometrics course for Caltech's Business, Economics, and Management option and, 59 students enrolled. Nine problem sets applied regression and hypothesis testing in R, which lectures did not cover, and the course ended with a long open-note final. Students rated me 5.00 on all four TA questions. One wrote that I was "extremely helpful during office hours," answered their questions by email when they could not attend, and graded the sets and final in a way that was "very fair."

BEM 103 Introduction to Finance (Winter 2024). A 42-student introduction to investments with problem sets, in-class quizzes, a stock-tracking journal, a midterm, and a final. Students rated my comments on their work 5.00 out of 5.

BEM 114 Hedge Funds (Spring 2024). A 36-student course in which groups analyzed financial data in Python across five problem sets, sat a midterm, and built and tested their own trading strategies in a final project. One student called me "one of the best TAs I've had in an HSS course." In May 2024 I gave the midterm to ChatGPT and graded its answers by the same standard as

students'. It scored 88.5 out of 100: clear on short selling and on why investors hold the market portfolio, but missing subtle points specific to our course, and strikingly similar to many students' submissions. I reported the result to the instructor, and it has shaped how I think about assessment since.

Ec 117 Matching Markets (Fall 2024). An upper-level course on matching theory and market design with 36 students, taught entirely through proofs: two problem sets, a midterm, and a final. It is the course closest to my training as a theorist. Most of my work was grading those proofs and showing, step by step, what a complete argument required. Students rated me 5.00 out of 5 on all four TA questions.

BEM/Ec/ESE 119 Environmental Economics (Spring 2026). A 35-student course built on four problem sets, two in-class strategy games in which students played fisheries and OPEC members, readings from research papers, and an in-person final. Thirty-one students completed evaluations and rated me above the Caltech average on all four TA questions; their comments point to timely grading and fair handling of regrade requests. The course's structure, with practice outside class and evaluation inside it, is close to the design I describe above.

Future Courses

I am prepared to teach undergraduate microeconomics at every level and first-year graduate microeconomic theory. The courses below reflect my main teaching interests and draw on my research and mathematical training.

(1) **Microeconomics** (undergraduate or first-year graduate).I am prepared to teach undergraduate microeconomics at every level and first-year graduate microeconomic theory. My doctoral training and research in microeconomic theory provide a strong foundation for teaching these courses. I would emphasize how economic models translate questions about individual choices and market outcomes into problems that students can analyze, paying attention to the assumptions behind each result and its economic interpretation.

(2) **Information economics** (undergraduate elective or graduate topics). An undergraduate course would cover adverse selection, moral hazard, signaling, screening, and games with incomplete information, emphasizing applications to industrial organization, such as firms' pricing and contracting decisions. Drawing on my research, I would introduce information acquisition, attention, social learning, and information aggregation as advanced modules. These topics could also form the basis of a graduate course on how people acquire information and learn through communication and observation. Related teaching interests include social choice, particularly voting and the aggregation of preferences.

(3) **Mathematical and quantitative economics** (undergraduate or graduate mathematics preparation). I am prepared to teach undergraduate mathematical economics and a graduate math camp. Depending on the level, these courses would cover calculus, linear algebra, optimization, convex analysis, and probability, connecting the tools to their uses in economic models. A broader undergraduate quantitative economics course could also include regression and statistical applications.

References

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Liang, W., Yuksekgonul, M., Mao, Y., Wu, E., and Zou, J. (2023). GPT detectors are biased against non-native English writers. *Patterns*, 4(7).