TEACHING STATEMENT

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Teaching has always been a great experience for me during my years in the University of Illinois. My teaching experience begins in 2015 when I was a teaching assistant for two courses: Microeconomic Principles and Macroeconomic Principles. I was later appointed as the head teaching assistant for Macroeconomic Principles in 2016. During this time, I started to learn how to design contents for the discussion sessions, to prepare exam questions, and to work closely with the main instructor to address questions from the students. These experiences had prepared me to teach my own courses on the topic of Game Theory. In this statement, I will discuss my teaching method and philosophy for the two courses on Game Theory that I have been teaching since 2017, and how my research has been incorporated into the teaching.

Econ 199: Intro to Game Theory. This course is an elective one open to all undergraduate students. It introduces students with the idea of using game theory to organize their thinking in strategic interactions. The goal is to help students develop a consistent way of thinking so that they can use what they learned in class to examine strategic incentives in real-world applications, e.g., climate change, political elections, management-labor relations, auctions, etc. The most challenging part of this course is to help students recognize the similarity among seemingly different strategic situations without using mathematics, so that they can learn to apply a united approach to analyze the likely outcomes. To overcome this challenge, I prepare a simple game for each class. I begin by dividing students into smaller groups to play the game, and then I lead a short discussion to let students share their thoughts during the gameplay. The rest of the class is then devoted to discussion on how this simple game is similar to other real-world situations and showing the students how game-theoretic tools can be applied for this type of games. For example, when introducing the simultaneous-move games, I designed various versions of the Match-Penny game for the students. The purpose is to first demonstrate the concept of simultaneous-move and then to show how it could change the outcome of interactions. After the gameplay and discussion, I then point out that this type of games is similar to the story in 'The Gift of the Magi' and also to real-world situation between Microsoft and Sony for example who need to price their next-generation gaming console without knowing the other's pricing decision. I then show students how the Matching-Penny game can be modeled using the normal-form representation and work with students to apply it to the other two examples. The assignments are designed as extension of the lectures to encourage students to apply what they learned in class for real-world situations. In the take-home final exam, students are asked to choose a topic of their own and choose appropriate game-theoretic tools to analyze the problem by themselves. This approach turns out to be successful. Many students have expressed interests in continuing to learn more about game theory.

Econ 437: Game Theory. This course is also an elective one but mostly for students of economics major in junior/senior year. Many students of this course are applying for graduate schools to continue their studies in economics. For this course, I have used a slightly more formal approach of using mathematics to form relatively more rigorous derivation and analysis. The philosophy is to help students develop the required skills with 'well-structured' challenges. The reason for imposing some challenges for the students is not for the sake of challenges. The real reason is to let students delve deeper into the strategic situations so that they are equipped with all the necessary tools for conducting independent game-theoretic analysis in their future: whether that is a career in a business-consulting firm or continuing study in graduate school. For this course, I begin each class with a puzzling observation and then develops the mathematical models and tools to explain the observation. In all stages of the theory building and exercises, I heavily involve the students by asking whether the theory could be built in an alternative way so that students are not blindly follow the existing theory but form their own evaluation instead. All these challenges are overcame through the help of in-class discussions, detailed and well-structured problem sets. Many students comment that this course has helped them in their critical-thinking skills and they have obtained new perspectives for the world. This course has high evaluation by the students, for which I was listed in the campus-wide 'List of Teachers Ranked as Excellent by Students' in one semester.

From Research to Teaching: Climate Economics. My own research on the international cooperation for climate change has created many interesting applications for the game theory course. It helped students apply game theory to study various aspects of this real problem that are consequential. These applications can also be organized and designed for a course that is specifically on climate economics with some brief introduction on integrated modeling of climate and the economy. In addition, through the work on the collaborative research project of Climate Action Gaming Experiment (CAGE), I have developed a series of in-class simulations that can be used for an intro-level course where students can clearly see how climate policies can affect the global climate and the regional economies. In one semester, the CAGE research team and I were invited by Prof. Abelson as a guest instructor to design and lead the simulation for students in ENG 571: Theory of Energy and Sustainability Engineering. Inspired by the positive feedbacks from the students, I believe these simulations of climate economics can be expanded to support a course that is suitable to students with various background. I look forward to an opportunity to incorporate more of my research into teaching.

Teaching Evaluations. In the table below, I listed the quantitative evaluation results from semesters I taught at the University of Illinois at Urbana-Champaign, where I served as a teaching assistant for 10 semesters.

Semester	Course	Teaching Effectiveness	Quality of the Course
Spring 2015	Econ 103: Macroeconomic Principles	3.9	3.9
Fall 2015	Econ 102: Microeconomic Principles	3.3	3.7
Spring 2016	Econ 103: Macroeconomic Principles	4.2	4.3
Fall 2016	Econ 103: Macroeconomic Principles	3.8	3.7
Fall 2017	Econ 199: Intro to Game Theory	4.3	4.3
Spring 2018	Econ 490: Game Theory	4.0	3.8
Fall 2018	Econ 437: Game Theory	4.4	4.5
Spring 2019	Econ 437: Game Theory	4.3	4.5
Fall 2019*	Econ 437: Game Theory	4.3	4.3
Spring 2020	Econ 437: Game Theory	4.3	4.4

Note: Based on the Instructor & Course Evaluation System (ICES), https://citl.illinois.edu/citl-101/measurement-evaluation/teaching-evaluation/teaching-evaluations. Teaching Effectiveness shown a response to the question "Rate the instructor?s overall teaching effectiveness". Quality of the Course is a response to the question "Rate the overall quality of the course". Students rate on an integer scale from 1 being exceptionally low to 5 being exceptionally high. *Included in the List of Teachers Ranked as Excellent by their Students on semester basis. For details, please visit https://citl.illinois.edu/citl-101/measurement-evaluation/teaching-evaluation/teaching-evaluations-(ices)/teachers-ranked-as-excellent.

Selected Comments from Students. [1]

Econ 199 || Econ 437 || Econ 490 (Instructor)

"One of the best instructors I've had in the econ department"

"Extremely thorough lecture notes, very useful"

"Very clear instruction. Problem sets also extremely helpful to the understanding of class material."

"The instructor had a very clear progression in the course, with each concept building on previous chapters."

"Very agreeable and charismatic, and easy to understand."

"The instructor was very knowledgable and did a great job of explaining topics. Personally one of the best instructors I've had here."

"He is smart and extremely patient."

Econ 102 || Econ 103 (Teaching Assistant)

"Bei was very helpful and adapted to our needs."

"Very good at thoroughly explaining the course material discussed in lecture. Bei answered emails efficiently."

"Bei was a very good TA for the course. I really appreciated how he was always open to taking student questions and the feedback he give on a draft of my term paper."

"Knows the material well and is able to explain it to the class well."

[1] These comments are from the ICES evaluation forms filled by students at end of semester.