CSC 85010 Epistemic Logic and Game Theory
Professor Rohit Parikh
Tuesdays, 4:15 – 6:15 pm

We will offer an introduction to Epistemic logic including models, axioms and completeness; and knowledge update. We will also offer an introduction to game theory including the relevance of epistemic considerations in how games are played.

For a more detailed description:

Topics from game theory: Preferences and utility. Expected utility. Normal form and extensive form games. Nash equilibrium. Backward induction. Aumann's agreeing to disagree theorem and sequels. Nash bargaining. Cooperative games. Evolutionary game theory.

Topics from epistemic logic: Axioms and models. Soundness and completeness of axioms. Decidability and complexity. Knowledge update and Dynamic epistemic logic.

Other topics: Game theoretic considerations in communication. Social choice theory, including Arrow's theorem. Gettier type problems and the nature of knowledge. Influencing behavior by influencing knowledge, and conversely, inferring belief from behavior. The exact topics chosen will depend on the interests of the students and the instructor.

Suggested references:

Game Theory: A Multi-Leveled Approach, by Dr. Hans Peters

A Course in Game Theory, by Martin J. Osborne and Ariel Rubinstein

Networks, Crowds, and Markets: Reasoning About a Highly Connected World, by David Easley and Jon Kleinberg

Lecture Notes in Microeconomic Theory: The Economic Agent, by Ariel Rubinstein

Some of these books can be downloaded from the web.

Pre-requisite: Feeling comfortable with basic discrete mathematics.