Philosophy 141: Philosophy and Game Theory
TuTh 12:30-2:00, 30 Wheeler

Instructor: Lara Buchak, buchak@berkeley.edu
Office Hours: Tuesday 2-4 (drop in), or by appointment.
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GSI: Alex Hansen, aphansen@berkeley.edu

Course Description

This course deals with applications of game and decision theory to philosophical problems, as well as with paradoxes and problems introduced by these theories. The first section of the course will introduce the basic concepts of game and decision theory. The next section will be devoted to non-cooperative games, such as the Prisoner's Dilemma; the possible application of these games to moral problems; and the need for and execution of a social contract. Next, we will explore problems of cooperation and convention: how people manage to coordinate their actions for mutual benefit, e.g. drive on the same side of the road, carry out a project together, or use language. Finally, we will turn to problems dealing with groups, such as problems of collective action and decision making.

Prerequisites

Two courses offered by a philosophy department. No background in game theory or decision theory is required, but students should be comfortable with mathematical subject matter.

Texts

Required:

Axelrod, Robert. The Evolution of Cooperation. Basic Books, 1984.
Lewis, David. Convention: A Philosophical Study. Harvard University Press, 1969.
Resnik, Michael. Choices: An Introduction to Decision Theory. University of Minnesota Press, 1987.
Skyrms, Brian. Evolution of the Social Contract. Cambridge University Press, 1996.
Skyrms, Brian. The Stag Hunt and the Evolution of Social Structure. Cambridge University Press, 2004.
Course Reader, available at Copy Central.

Recommended:

Osborne and Rubenstein. A Course in Game Theory. MIT Press, 1994.

Assignments and Grading Breakdown

Papers: Each student will write two 7-page papers, due 3/21 and 5/9. [25%, 25%]

Problem Sets: There will be biweekly problem sets. [10%]

Exams: There will be a midterm on 2/18 [10%] and a final exam on 5/15 [20%]. Exams will be a mix of short answer questions, problems, and long essay questions.

Participation: Includes section participation and in-class demonstrations. [10%]

Late Work Policy

NO LATE WORK WILL BE ACCEPTED WITHOUT A MEDICAL EXCUSE.

Electronics Policy

Please do not use laptops, cell phones, or any other electronic device during class.

Conflict Policy

If you have a conflict that will keep you from attending a class, you must let your GSI know in the first two weeks of class, so that you can make arrangements to make up the class time and hand in the assignment for the day.

Statement of Academic Integrity

"Any test, paper or report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course unless you obtain prior written approval to do so from your instructor.

In all of your assignments, including your homework or drafts of papers, you may use words or ideas written by other individuals in publications, web sites, or other sources, but only with proper attribution. "Proper attribution" means that you have fully identified the original source and extent of your use of the words or ideas of others that you reproduce in your work for this course, usually in the form of a footnote or parenthesis.

As a general rule, if you are citing from a published source or from a web site and the quotation is short (up to a sentence or two) place it in quotation marks; if you employ a longer passage from a publication or web site, please indent it and use single spacing. In both cases, be sure to cite the original source in a footnote or in parentheses.

If you are not clear about the expectations for completing an assignment or taking a test or examination, be sure to seek clarification from your instructor or GSI beforehand.

Finally, you should keep in mind that as a member of the campus community, you are expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits. So be proud of your academic accomplishments and help to protect and promote academic integrity at Berkeley. The consequences of cheating and academic dishonesty—including a formal discipline file, possible loss of future internship, scholarship, or employment opportunities, and denial of admission to graduate school—are simply not worth it."

--From the Report of the Academic Dishonesty and Plagiarism Subcommittee (June 18, 2004)

Cheating or plagiarism may result in an automatic F for the course.

PART I. Game-Theoretic Rationality

Session 1. Introduction (1/21)

Session 2. Individual Rationality: Decision Problems, Dominance Reasoning (1/23)
Resnik, pp 3-20
Optional: Osborne and Rubenstein, pp 1-5.

Session 3. Individual Rationality: Probability (1/28)
Resnik, pp 47-54.

Session 4. Individual Rationality: Expected Utility Theorem (1/30)
Resnik, pp 81-100.

Session 5. Paradoxes and Criticism, Newcomb's Problem (2/4)
Resnik, pp 101-120

Session 6. Games and Strategies (2/6)
Resnik, pp 121-127.

2/11: NO CLASS

Session 7. Solution Concepts (2/13)
Resnik, pp 127-147 (skip 5-3b)
Optional: Osborne and Rubenstein, pp 11-19, 37-44.

2/18: MIDTERM

PART II. Prisoner's Dilemma

Session 8. Prisoner's Dilemma (2/20)
Resnik, pp 147-151.
David Lewis, "Prisoner's Dilemma is a Newcomb Problem." In Course Reader.
Optional: Bicchieri, Cristina and Mitchell S. Green, "Symmetry Arguments for Cooperation in the Prisoner's Dilemma." In Course Reader.

Session 9. Morality and Rationality I (2/25)
David Gauthier, "Why Contractarianism?" In Course Reader.
Resnik, pp 151-157.

Session 10. Morality and Rationality II (2/27)
Holly Smith, "Deriving Morality from Rationality." In Course Reader.

--*FIRST PAPER ASSIGNED 2/27*

Session 11. Commitment (3/4)
Kavka, Gregory. "The Toxin Puzzle." *Analysis* 43(1), 1983: 33-36. In Course Reader.
Kavka, "Some Paradoxes of Deterrence." *Journal of Philosophy* 75(6), 1978: 285-302. In Course Reader.

Sessions 12-13. Repeated Prisoner's Dilemma I (3/6 & 3/11)
Axelrod, Robert. The Evolution of Cooperation.
--PD Tournament announced 3/6
--*Entries for PD tournament due 3/11*

Sessions 14 & 15. Repeated Prisoner's Dilemma II (3/13 & 3/18)
Skyrms, Brian. Evolution of the Social Contract. Chapters 1-3.
--Class PD tournament

--FIRST PAPER DUE FRIDAY 3/21

PART III. Coordination

Session 16. Coordination Problems and Multiple Equilibria (3/20)
Lewis, David. Convention. Pp 1-36.

(3/24-3/28: SPRING BREAK)

Sessions 17 & 18. Conventions (4/1 & 4/3)
Lewis, pp 36-51, 68-76, 83-107, 118-121.
Optional: Lewis, pp 76-82, pp 107-118.

Session 19. Levels of Knowledge, Common Knowledge, Backward Induction (4/8)
Lewis, pp 52-68.
Optional: Quine, W.V. "On a So-Called Paradox." *Mind* 62(245), 1953: 65-67. In Course Reader.
Optional: Osborne and Rubenstein, pp 67-75, 81-85

Session 20. Convention and Communication (4/10)
Lewis, pp 122-159.

Sessions 21 & 22. The Stag Hunt, Evolution and Learning (4/15 & 4/17)
Skyrms, Brian. The Stag Hunt and The Evolution of Social Structure, pp 1-81
Optional: Skyrms, Brian. Evolution of the Social Contract, pp 80-104.

--SECOND PAPER ASSIGNED 4/17

PART IV. Social Choice

Sessions 23 & 24. Arrow's Theorem (4/22 & 4/24)
Resnik, Michael. Choices. 177-195 (187-191 and proof on 194-195 are optional)
--FINAL PAPER ASSIGNED

Session 25. Liberalism (4/29)
Sen, Amartya. "The impossibility of a Paretian liberal." In READER.
Optional: Sen, Amartya. "Liberty and Social Choice." In READER.

Session 26. Utilitarianism (5/1)
Resnik, Michael. Choices. 196-212 (200-205 optional).

--SECOND PAPER DUE FRIDAY 5/9

THURSDAY 5/15 – *FINAL EXAM (3-6 PM)*