

DECISIONS, GAMES, AND RATIONAL CHOICE

INSTRUCTOR	Angela Sun angsun@umich.edu
DESCRIPTION	In this course, we will explore ways that philosophers and social scientists have approached rational decision-making, both at the individual and the group level. We will begin with a unit on individual decision-making, focusing on expected utility theory—the view that rational choices are those that maximize expected utility—and considering the advantages and disadvantages of this view. Next is a unit on game theory, where we will learn mathematical models for strategic interactions. Finally is a unit on group decision-making, where we will consider, among other things, the possibility group intentions and decisions.
GOALS	By the end of this course, students will have developed the following knowledge and skills: <ul style="list-style-type: none">• An understanding of key concepts in decision theory and game theory.• The ability to use formal methods to solve philosophical problems.• The ability to defend a position with clear, rigorous argumentation.• The ability to engage in philosophical discussion respectfully and productively.
TEXTS	You won't need to buy a textbook for this course. All the assigned readings are linked on the syllabus. Some of the readings are from the following open-access textbooks, which you should download now: <ul style="list-style-type: none">• Giacomo Bonanno, <i>Game Theory</i>• Brian Weatherson, <i>Lecture Notes on Decision Theory</i>• Jonathan Weisberg, <i>Odds & Ends: Introducing Probability and Decision with a Visual Emphasis</i>
REQUIREMENTS	The requirements for the course are as follows: <ul style="list-style-type: none">• <i>Problem sets</i> (6 x 8% = 48%): Over the course of the semester, you will submit six problem sets. Collaboration is encouraged!• <i>Take-home exam</i> (20%): At the end of unit 2, you will complete a take-home exam. The exam will be open-book, but collaboration is not allowed.• <i>Paper</i> (25%): At the end of the course, you will submit a 1500-word paper on your choice of three topics.• <i>Participation</i> (7%): Come to class having completed the reading and prepared to discuss it!
ACCOMMODATION	I will work with every student interested in taking this course to ensure it's possible to. If you have a disability, are struggling with mental or physical health, or if there is anything else that might prevent you from fully participating in this course, let me know as soon as you can, and we will figure something out.

SCHEDULE

UNIT 1: INDIVIDUAL DECISION-MAKING

Day 1: What is practical rationality?

R.J. Wallace, §1 ("Practical and Theoretical Reason") and §5 ("Maximizing Rationality") of "[Practical Reason](#)"

Day 2: Probability

Weisberg, chapter 5 ("Calculating Probabilities"), chapter 6 ("Conditional Probabilities") and chapter 7 ("Calculating Probabilities, Part 2")

Day 3: Expected utility theory, part 1

Weisberg, chapter 11 ("Expected Value")

Day 4: Expected utility theory, part 2

Weisberg, chapter 12 ("Utility")

Day 5: The sure-thing principle and the Allais paradox

Weatherson, chapter 10 ("Sure Thing Principle")

Day 6: Risk-weighted expected utility

Lara Buchak, "[Risk and Tradeoffs](#)"

Day 7: The problem of unbounded utility

Weisberg, chapter 14 ("Infinity and Beyond")

Day 8: Dutch book arguments

Weisberg, appendix B ("The Axioms of Probability") and chapter 17 ("Dutch Books")

Day 9: Evidential decision theory, causal decision theory, and Newcomb's paradox, part 1

Weatherson, chapter 16 ("Newcomb's Problem"), chapter 17 ("Realistic Newcomb Problems"), and chapter 18 ("Causal Decision Theory")

Day 10: Evidential decision theory, causal decision theory, and Newcomb's paradox, part 2

No reading

Day 11: Temptation

Chrisoula Andreou, "[Temptation, Resolutions, and Regret](#)"

Day 12: Making choices for our future selves

Jennifer Morton, "[Deliberating for Our Far Future Selves](#)"

UNIT 2: GAME THEORY

Day 13: Games in strategic form

Bonanno, chapter 1 ("Ordinal Games in Strategic Form"), pp. 3-31

Day 14: Equilibria

Bonanno, chapter 1 ("Ordinal Games in Strategic Form"), pp. 32-36

Day 15: Dynamic games with perfect information

Bonanno, chapter 2 ("Dynamic Games with Perfect Information")

Day 16: Mixed strategies

Bonanno, chapter 5 ("Mixed Strategies in Strategic-Form Games")

Day 17: Dynamic games with imperfect information

Bonanno, chapter 14 ("Incomplete Information: Static Games") and chapter 15 ("Incomplete Information: Dynamic Games")

Day 18: Spence's signalling model

Michael Spence, "Job Market Signalling"

Day 19: Iterated prisoner's dilemmas

Watch "The Iterated Prisoner's Dilemma and the Evolution of Cooperation"

UNIT 3: GROUP DECISION-MAKING

Day 20: Group intention and action

Margaret Gilbert, "Walking Together: A Paradigmatic Social Phenomenon"

Day 21: Group knowledge

Jennifer Lackey, <https://philpapers.org/rec/LACSEK>

Day 22: Group decisions and voting systems

Weatherson, chapter 24 ("Group Decisions"), chapter 26 ("Voting Systems"), and chapter 27 ("More Voting Systems")

Day 23: Arrow's impossibility theorem

Weatherson, chapter 26 ("Arrow's Theorem")

Day 24: Collective responsibility

Jan Narveson, "Collective Responsibility"