

DECISION THEORY
PHIL 371
Fall 2023

CONTACT	Professor Angela Sun (she/her/hers) asun@wlu.edu
OFFICE HOURS	Wednesdays 3pm-5pm in Washington Hall 322 and by appointment
MEETINGS	Tuesdays and Thursdays 1:30pm-3:30pm, Washington Hall 115
DESCRIPTION	In this course, students will explore ways that rational decision-making both by individuals and by groups has been modeled in philosophy, political science, economics, and other social sciences. In addition to learning about the formal foundations of decision theory, students will be introduced to contemporary debates among philosophers working in decision theory.
REQUIREMENTS	The requirements for the course are as follows: <ul style="list-style-type: none">• <i>Problem sets</i> (5 x 8% = 40%): Submit 5 problem sets. Collaboration is encouraged, but "copying" is not allowed; everyone must complete and submit their own problem set. Make sure you note who you collaborated with on your problem set.• <i>Take-home midterm</i> (18%): At the end of unit 1, complete a take-home exam. The exam will be open-book, but collaboration is not allowed.• <i>Final paper outline</i> (2%): Submit an outline of your final paper. Outlines will be graded on the basis of completion.• <i>Final paper discussion</i> (2%): Lead a discussion about your final paper topic.• <i>Final paper</i> (20%): At the end of the course, submit a ~1000 word paper.• <i>Take-home final exam</i> (18%): At the end of the course, complete a final exam.
ATTENDANCE	We will cover a lot of material in lecture that is not in the readings. However, I will not take attendance and missing class will not itself affect your grade. You are responsible for catching up on material that you've missed.
ELECTRONICS	Laptops and tablets ok; cellphones not ok; doing things unrelated to class on electronics not ok.

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. I also completely understand if you would prefer keep information about your health confidential. If you would prefer to speak about accommodations anonymously, contact Lauren Kozak (kozak1@wlu.edu), Title IX Coordinator and Director of Disability Resources.

TEXTS Many readings are drawn from the following open-access textbooks. Other readings are either linked in the schedule below or available in the "Files" section of our Canvas site.

- Giacomo Bonanno, *Game Theory*, 2nd ed.
- Brian Weatherson, *Lecture Notes on Decision Theory*
- Jonathan Weisberg, *Odds & Ends: Introducing Probability and Decision Theory with a Visual Emphasis*

SCHEDULE UNIT 1: EXPECTED UTILITY THEORY

Jan. 10: Introduction

Jan. 12: The belief/desire model of reasons

- Colin McGinn, "*Belief, Desires, and Actions*"
- Weisberg, ch. 11 ("Expected Value")
- Weisberg, ch. 5 ("Calculating Probabilities")
- Weisberg, ch. 16 ("Beliefs and Betting Rates")

Jan 17: Expected utility theory

- Weisberg, ch. 12 ("Utility")

Jan. 19: Choice functions and Sen's principles α and β

- Sven Ove Hansson and Till Gr ne-Yanoff, "*Preferences*" (read §5 on "Preferences and choice")

Jan. 24: Observed violations of α and β

- PROBLEM SET 1 DUE
- Watch "*Decoy effect pricing strategy*"

Jan. 26: Dominance and the sure thing principle

- Weatherson, ch. 10 ("Sure Thing Principle")

Jan. 31: The Allais paradox

- Reread Weatherson, ch. 10.3 ("The Allais Paradox")

Feb. 2: Representation theorem, part 1

- Richard Bradley, "[Decision Theory: A Formal Philosophical Introduction](#)" (read §6.2 "Savage's Theory" and §6.3 "The Status of Savage's Axioms")

Feb. 7: Representation theorem, part 2

- PROBLEM SET 2 DUE

Feb. 9: Dutch book arguments

- Weisberg, ch. 17 ("Dutch Books")

Feb. 14: Evidential vs. causal decision theory, part 1

- PROBLEM SET 3 DUE
- Weatherson, ch. 16 ("Newcomb's Problem")
- Weatherson, ch. 17 ("Realistic Newcomb Problems")
- Weatherson, ch. 19 ("Causal Decision Theory")

Feb. 16: Evidential vs. causal decision theory, part 2

Feb. 21 & 23: No class (Washington break)

Feb. 28: Good's theorem

- I. J. Good, "[On the Principle of Total Evidence](#)"

Mar. 2: Temporal discounting and willpower

- George Ainslie, [Précis of Breakdown of Will](#)

UNIT 2: GAME THEORY

Mar. 7: Games

- Watch [the Battle of the Wits from The Princess Bride](#)
- Watch [the weirdest split or steal from Golden Balls](#)
- Bonanno, §2.1 ("Game frames and games")-§2.3 ("Second-price auction")

Mar. 9: Solving games

- TAKE-HOME MIDTERM DUE
- Bonanno, §2.5 ("Iterated Deletion Procedures")-§2.6 ("Nash Equilibria")

Mar. 14: Dynamic games with perfect information

- Bonanno, ch. 3 ("Perfect-Information Games")

Mar. 16: Dynamic games with imperfect information, part 1

- Bonanno, ch. 4 ("General Dynamic Games")

Mar. 21: Dynamic games with imperfect information, part 2

Mar. 23: Iterated games and evolutionarily stable strategies

- Watch "The Iterated Prisoner's Dilemma and the Evolution of Cooperation"
- Watch "Who Invented Rock, Paper, Scissors and What's the Best Way to Win Consistently?"

UNIT 3: SOCIAL CHOICE THEORY

Mar. 28: Group action

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

Mar. 30: Voting systems

- PROBLEM SET 4 DUE
- PAPER OUTLINE DUE
- Weatherson, ch. 24 ("Group Decisions")
- Weatherson, ch. 26 ("Voting Systems")
- Weatherson, ch. 27 ("More Voting Systems")

Apr. 4: Paper presentations

Apr. 6: Arrow's theorem

- PROBLEM SET 5 DUE
- Watch "Is Democracy Impossible? (Arrow's Theorem)"

April 10: PAPER DUE BY 11:59PM

Apr. 12: TAKE-HOME FINAL EXAM DUE BY 11:59PM