

PHL 348: Decision Theory
Spring 2018

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Office: Anspach 242
Office Hours: MWF 1:00-2:00,
and by appt.

Course Description: Life is full of choices. And while sometimes we make wise choices, sometimes we do not. But why? What makes some decisions rational and others irrational? This course seeks to answer that question. Topics will include decisions under certainty, ignorance and risk, the nature of utility, basic probability, and the fundamentals of game theory. The result will be a deeper understanding of human rationality, and skills to help make wise choices more often. Requirements will include homework, three regular exams, and one comprehensive final exam.

Required Text:

1. Resnik, Michael D. (1987). *Choices: An Introduction to Decision Theory*. Minneapolis, MN: University of Minnesota Press.
2. Other readings on Blackboard (indicated below by '[BB]')

Requirements:

Homework: 10%
Three regular exams: 20% each
Final exam: 30%

Academic Integrity: Cheating, plagiarism, and other forms of academic dishonesty will be dealt with in accordance with CMU's Policy on Academic Integrity, which can be found at: http://academicsenate.cmich.edu/NonCad/ACADEMIC_INTEGRITY_POLICY.pdf.

Accommodations for students with disabilities: CMU provides students with disabilities reasonable accommodation to participate in educational programs, activities, or services. Students with disabilities requiring accommodations to participate in class activities or meet course requirements should first register with the office of Student Disability Services (Park Library 120, telephone 989-774-3018, TDD #2568), and then contact the professor as soon as possible.

Electronics: You are welcome to take notes on a laptop or tablet, but if you choose to do so you must sit in the very back row of the classroom. Please refrain from using cell phones during class.

Tentative Schedule:

Date	Reading	Topic
1/8		Introduction: Normative v. Descriptive Theory; Individuals v. Games v. Social Choices; Synchronic v. Diachronic Choices; Rational v. Right Choices;
1/10	Resnik, pp. 3–17	The Matrix: Acts, States, Outcomes; Certainty, Ignorance, Risk;
1/15		NO CLASS Martin Luther King Jr. Day
1/17	Resnick, pp. 21–28	Utility: Ordinal v. Cardinal; Dominance; Maximin; Maximax;
1/22		Lexical Maximin; Lexical Maximax;
1/24	Resnick, pp. 28–32	Minimax Regret;
1/29	Resnick, pp. 32–35	Optimism–Pessimism;
1/31	Resnick, pp. 35–37 Peterson, pp. 71–73 [BB]	The Principle of Insufficient Reason; Maximizing Expected Utility;
2/5		REVIEW
2/7		FIRST EXAM
2/12	Resnick, pp. 81–91	Interval Scales and How to Calculate Them;
2/14	Resnick, pp. 45–53	The Probability Calculus;
2/19		Conditional Probabilities;
2/21	Resnick, pp. 53–55	Bayes’s Theorem;
2/26	Resnick, pp. 55–57	Prior Probabilities;
2/28	Resnick, pp. 61–74	Interpretations of Probability;

3/5		NO CLASS Spring Break
3/7		NO CLASS Spring Break
3/12		REVIEW
3/14		SECOND EXAM
3/19	Resnick, pp. 101–107	Objections I: Allais' Paradox; Ellsberg's Paradox;
3/21	Resnick, pp. 107–109	Objections II: The St. Petersburg Paradox; The Two–Envelope Paradox;
3/26	Resnick, pp. 109–119	Objections III: Newcomb's Paradox and Causal Decision Theory;
3/28	Bermúdez, “Making Sense of Utility and Preference” [BB]	Objections IV: Just what is utility, anyway?;
4/2	Bermúdez, “Individuating Out- comes” [BB]	Objections V: How can we carve up outcomes?;
4/4	Williams, “Internal and Exter- nal Reasons” [BB]	Objections VI: Can we rationally evaluate ends?;
4/9		REVIEW
4/11		THIRD EXAM
4/16	Peterson, pp. 212–224 [BB]	Fundamentals of Game Theory;
4/18	Peterson, pp. 224–233 [BB]	Dominance; Two–Person Zero–Sum Games; Minimax;
4/23	Peterson, pp. 240–254 [BB]	Non–Zero–Sum Games;
4/25		REVIEW
5/2 2PM		FINAL EXAM