Rational Choice
Carnegie Mellon University
Fall 2010

*Reason is, and ought only to be slave to the passions, and
can never pretend to any other office than to serve and
obey them.*

~ David Hume ~

| **Instructor:** | **Grader:** |

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We often criticize one another's decisions. People who spend their money at casinos are charged with being ignorant, people who save too much are regarded as miserly, people who chose unpleasant mates are fooling themselves, etc. Often times we criticize one another because we disagree with their values -- a greedy CEO is criticized because he cares too much about money. In this course, we will focus on a different sort of criticism, an internal criticism where we regard people as behaving inconsistently with their own ends. Implicitly judgments like this rely on a notion of "correct" decision making, which will be the topic of our course.

This theory, as it has been developed over many years, is now very detailed and complicated; it involves significant mathematics. The theory is not without its critics either, and we will review a few of those criticisms as well. Ultimately, learning about this theory will help to tune ones thinking about a variety of problems from gambling to investing to one's romantic life.

Required Texts:	David M. Kreps (1988) *Notes on the Theory of Choice*. Westview Press
Course Requirements:	5 Homeworks due throughout the semester – dates to be announced in class* Attendance **and participation in class discussion** can positively influence your grade up to a full letter grade Graduate students will be given extra homework problems

(*) You are allowed to discuss the homework with one another in attempting to solve the problems, but each individual student must write up the answers independently. If you collaborated with another student in solving a particular problem **you must note who that student is and on which problems you collaborated**. Copying verbatim answers or failing to note collaboration constitutes academic dishonesty.

Reading Schedule

Aug 24	Hume, Kant, and axiomatic methods
Aug 26	Set theory and an introduction to preferences (online; Kreps chapter 2)
Aug 31	Preferences with a few objections (Kreps chapter 2; additional reading online)
Sept 2	Ordinal utility (Kreps chapter 3)
Sept 7	Normal form, dominance (readings online)
Sept 9	Decision under ignorance – maximin, maximax, etc. (online)
Sept 14	Introduction to probability (online)
Sept 16	Bayes theorem and belief revision (online)
Sept 21	Interpretations of probability (online)
Sept 23	Why probability? Dutch books and distance measures (online)
Sept 28	Cardinal utilities and expected utility (online)
Sept 30	DeFinetti and soliciting probabilities with bets (online)
Oct 5	Three theories on getting a utility function (Kreps chapter 4)
Oct 7	Introduction to Von Neumann/Morgenstern (Kreps chapter 5)
Oct 12	Von Neumann/Morgenstern continued (Kreps chapter 5)
Oct 14	St. Petersburg and utility for money (Kreps chapter 6)
Oct 19	Allais' and Zeckhauser's paradox (online)
Oct 21	Anscombe/Aumann (Kreps chapter 7)
Oct 26	Anscombe/Aumann continued (Kreps chapter 7)
Oct 28	Soliciting probabilities without utilities (Kreps chapter 8)
Nov 2	Savage's axioms (Kreps chapter 9, through page 132)
Nov 4	Savage's theory (remaining part of Kreps chapter 9)
Nov 9	Conditional Choice (Kreps chapter 10)
Nov 11	Newcomb's problem and act-state dependence (online)
Nov 16	Ellsberg's paradox and alternative probability representations (online)
Nov 18	Introduction to social choice (online)
Nov 23	Arrow's theorem (online)
Nov 25	Rational turkey
Nov. 30	Interpersonal comparisons of utility and Harsanyi's theorem (online)
Dec 2	Spill over