

# ECONOMICS 171: DECISIONS UNDER UNCERTAINTY

Winter 2020

Lectures: MWF 12:00 – 12:50 pm in CENTR 113

Discussions: Wednesdays 7:00 – 7:50 pm & 8:00 – 8:50 pm in CENTR 216

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Instructor and TA office hours will be posted as an announcement on TritonEd.

Course webpage: <https://triton.ed.ucsd.edu/>

This course examines how economic agents make decisions under conditions of uncertainty. It examines the various ways in which economists represent the phenomenon of uncertainty, the fundamental principles of choice under uncertainty, the concepts and measurement of “risk” and “risk aversion,” and the analysis of how these features influence economic behavior. In the process of presenting this material, we will examine laboratory methods for eliciting and testing hypotheses about attitudes toward risk, the representation and elicitation of uncertain beliefs, intertemporal choice under uncertainty, psychological evidence and other “paradoxes” that attack the standard economic approach, and current research in light of this evidence.

## Prerequisites:

Econ 100A and Econ 120A or ECE 109 or Math 180A or Math 183 or Math 186.

## Lectures and Discussion Sessions:

You are responsible for all the material in the lectures and problem sets. Partial notes will be available on the class webpage before each lecture. I recommend that you print these out before hand and fill in the missing information as we go. I’ll do my best to avoid typos but you’re responsible for the correct material. I want you to understand the material instead of simply memorizing it. The audio and material projected on the screen will supposedly be podcasted. If you miss a lecture, watch the podcast or borrow someone’s notes. Discussion Sessions are optional but recommended.

## Exams:

Your grade will be determined on the basis of two Midterm Exams (25% each) and the Final Exam (50%). Alternatively your lower midterm will count for 15%; your higher midterm will count for 25% and your final will count for 60%.

Midterm 1 will be held in class on Monday, January 27th. Midterm 2 will be held in class on Friday, February 21st. The final exam will be held on Wednesday, March 18th from 11:30am – 2:30pm. If you know in advance that you cannot make an exam, please let me know as soon as possible.

You must get the instructor’s permission (in advance if possible) if you miss a midterm. If you miss a midterm for an approved reason the weight for that exam will be placed on the final. If you miss the final exam for a documented, university approved reason (ie., illness, official university trip), you will most likely receive an Incomplete for the class and will need to make-up the exam during the following quarter. If you miss the final exam for another reason (ie., oversleep) you will receive a zero for the exam. No one will be allowed to start an exam after the first person leaves it.

You are only permitted to use pens and pencils, a straight edge and a **single** note sheet during each exam. Calculators are **not** permitted. The note sheet can be any physical size up to 8.5” by 5.5” for the midterms and up to 8.5” by 11” for the final. It may **only** have handwritten notes on both sides. Typed or mechanically reproduced notes are not permitted. Do **not** attach anything to your note sheet. If your note sheet does not adhere to any of these conditions, it will be immediately confiscated during the exam. Additionally, a report may be filed with the Academic Integrity Office.

If seats are assigned for exams, anyone not sitting in his or her assigned seat will lose points on that exam. If there is a problem with your assigned seat please let us know so we can reassign you.

#### Academic dishonesty:

I take academic dishonesty seriously. Any student found guilty of academic dishonesty will most likely earn a failing grade for the course. In addition to this sanction, the Council of Deans of Student Affairs will also impose a disciplinary penalty. For a review of UCSD policy, please see <http://www-senate.ucsd.edu/manual/appendices/app2.htm>.

#### Regrade requests:

Regrade requests may be submitted via Gradescope during the weeklong regrade period. The regrade period will probably begin a day or two after the exam results are made available to the class. Please do not contact the instructor or any of the TAs regarding the grading of an exam or the grading for the course before the regrade period begins. If your TA agrees with your request, your score for that question will be corrected. If your TA disagrees with your request, you will lose 1 point for each midterm question and 2 points for each final exam question.

#### Optional Reference:

Intro to Decision Theory by Peterson. Additional references will be given in some sets of notes. These references are not required but may help your understanding of the material.

#### Problem Sets:

Problem sets will be available online. We will go over these questions in office hours and in the discussion sections. Your best practice for the exams is to try these questions yourself first.

#### Preliminary Course Outline:

1. Introduction: Aspects of Decision Making Under Uncertainty
  - a. Positive decision theory vs. normative decision theory.
  - b. The representation of uncertainty.
  - c. Criteria for choice under uncertainty
2. Preliminary Concepts in Probability Theory
  - a. Probability distributions and cumulative distribution functions.
  - b. Expected value, variance and skewness.
  - c. Concave functions, convex functions.
  - d. Conditional probability and Bayes' Law.
  - e. Compound lotteries and probability mixtures.
3. Expected Utility Risk Preferences
  - a. Expected utility preferences over lotteries.
  - b. The axioms of expected utility theory.
  - c. The expected utility representation theorem.
4. Risk and Risk Aversion
  - a. Certainty equivalents, risk premiums and attitudes toward risk.
  - b. The Arrow-Pratt characterization of comparative risk aversion.
  - c. Comparative risk and the theory of stochastic dominance.
  - d. Comparative statics of risk and risk aversion.
5. Techniques for Assessing Risk Preferences and Beliefs
  - a. Methodological issues and basic techniques.
  - b. Assessing von Neumann-Morgenstern utility functions.
6. Prospect Theory
7. Updating Beliefs
8. Subjective Uncertainty (time permitting)