ECONOMICS 171: DECISIONS UNDER UNCERTAINTY   Fall 2021

Instructor: Herb Newhouse (hnewhouse@ucsd.edu)   Course webpage: https://canvas.ucsd.edu/
Lectures: MWF 10:00 – 10:50 am in Solis 104   Discussions: F 3:00 – 3:50 pm and 4:00 – 4:50 pm

TAs: Jaeyeon Shin (j8shin@ucsd.edu), Muhammad Karim (mukarim@ucsd.edu) and Miles Berg
(mlberg@ucsd.edu).
The instructor and TA office hours will be held online. Further information will be posted on Canvas.

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 or 170A; and ECON 120A or ECE 109 or Math. 180A or Math. 183 or Math. 186

Lectures, Discussion Sections and Review Sessions:

You are responsible for all the material in lecture and in the 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. 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. If you miss a lecture, borrow someone's
notes. We will schedule a review session for each exam. Discussion sections are optional but
recommended.

Lectures, discussion sections and review sessions will be recorded.

Grading:

My prediction of how I will assess you in this course is:

Your grade will be determined based on two midterm exams and a final exam. Each exam will count as one
third of your overall grade. If you miss an exam for a documented, university approved reason (ie., illness,
official university trip), you will need to take a make-up exam. The make-up exam will most likely be an
oral exam. If you miss an exam for another reason (ie., oversleep, forget the time), you will receive a zero
on the exam.

Midterm 1 will be held during a window that includes our class hours on Friday, October 15th. Midterm 2
will be held during a window that includes our class hours on Wednesday, November 10th. The final exam
will be held on Friday, December 10th during a window that overlaps our officially scheduled time
between 8:00 and 11:00 am. **You must take the final exam during the time scheduled for your officially
enrolled class!** I expect that each midterm will last approximately 40 minutes and that the final exam will
last between 50 and 60 minutes. I also expect that most students will need approximately 10-20 minutes for
setup and submission. If you know in advance that you cannot make an exam, please let me know as soon
as possible.

You are only permitted to use pens and pencils, a straight edge, a **single** note sheet and a calculator during
each exam. The note sheet can be any physical size up to 8.5" by 11". 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.

While I will do what I can to keep to the predicted assessments for this course, the evolving situation may make it necessary for me to make changes.

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.

We will likely use Zoom for proctoring this quarter. It uses video and audio recording or other personal information capture for the purpose of facilitating the course and/or test environment. UC San Diego does not allow vendors to use this information for other purposes. Recordings will be deleted when no longer necessary. However, if cheating is suspected, the recording may become part of the student's administrative disciplinary record

A TA or I may request a copy of your exam recordings. Failure to provide us with a copy upon request will result in a grade of zero on the corresponding exam. **You must keep a copy of your exam recordings until Saturday, March 19th, 2022.** Zoom recordings that are automatically saved to the cloud are deleted after a certain amount of time. If you save any of your exam recordings to the cloud, make sure you download them locally so that you can provide them to us if you are requested to do so.

Finally, I reserve the right to give an oral test if I feel it is necessary to uphold academic integrity.

Regrade requests:

Regrade requests may be submitted via Gradescope during the week long 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)