Syllabus for Economics 106 :
Decision Making

SPRING 2025

Professor Giacomo Bonanno

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Classes: Tuesday and Thursday 9:00-10:20pm, WELLMAN 2

Office hours: Wednesay, 10:30 am -12:00 pm and 1:00-2:30 pm

First Midterm exam: Thursday, April 24
Second Midterm exam: Thursday, May 22
Final Exam [comprehensive]**:** Tuesday, June 10, 8:00 – 10:00 am

W A R N I N G : **(1)** You are expected to be familiar with the UC Davis Code of Academic Conduct (http://sja.ucdavis.edu/files/cac.pdf). Any suspected violation will be reported to the office of Student Judicial Affairs. If you are found by Judicial Affairs to have cheated on an exam, you will receive an "F" in the entire course. If you are found to have cheated on assignments worth at least 2% of your course grade, you will receive one whole letter grade less than your final course score would have indicated. **(2)** This is a conceptually demanding class. To earn a passing grade you need to work hard: **at least 6 hours of home study per week** (the Carnegie Rule does apply to this class). If you are not prepared to devote a lot of time and effort to this class you are strongly advised not to enroll in it.

*Prerequisites***:** Mathematics 16A-16B or 17A-17B or 21A-21B; Statistics 13 or 32, with grade of C− or better in each course. If you have an aversion to, or difficulties with, mathematical reasoning this course is **not** for you.

Web Page: http://www.econ.ucdavis.edu/faculty/bonanno/teaching/106/ On the web page you will find lecture slides, practice exams with answers, etc.

Textbook: Giacomo Bonanno, *Decision Making*, 2017 (the pdf version is available for free, the printed version is available from Amazon.com for $20; see: http://faculty.econ.ucdavis.edu/faculty/bonanno/DM_Book.html).

Homework. There are **6 Homework Problems**, *in the form of Canvas quizzes* (worth a total of 70 points). They are due every Friday (starting from April 11, skipping April 25 and May 9) by 11:59pm. Each quiz will be available at least 7 days before the deadline, so you you will have plenty of time to take them. Hence, **do not ask for extensions**, because they will be denied. For each quiz you will be allowed **2 attempts** until the deadline for submission**.**

Exams and Grades: there will be **two** midterm exams and a comprehensive final exam. The dates of the exams are given above. Your overall class grade will be based on your performance in the homework and in the three exams with the following weights: 10% on the Homework (scaled to 100), 25% on each midterm and 40% on the Final. **I do NOT grade "on the curve"** (see table below). For example, suppose that your scores are: (1) Homework total 56 (out of 70), (2) First Midterm 72 (out of 100), (3) Second Midterm 68 (out of 100), (4) Final 84 (out of 100). Then your class score is:

$$\frac{10}{100} \cdot \left(\frac{56}{70} \cdot 100 \right) + \frac{25}{100} \cdot 72 + \frac{25}{100} \cdot 68 + \frac{40}{100} \cdot 84 = 76.6$$

which corresponds to a grade of B− (see table below).

Practice Problems: in the textbook you will find a total of 121 exercises with detailed answers. It is **essential** that you go through them in order to be well prepared for the exams. Exam questions will be similar in format and difficulty to the exercises in the textbook and the homework. It is imperative that you do not look at the answers until you are confident that you have fully answered the question. If you look at the answers in order to get a clue, you are making a BIG mistake! If you get stuck, try to uncover the reason why you are stuck, do **not** look at the answers. Most likely, either you have forgotten an important definition or you have not studied the textbook carefully enough.

IMPORTANT RULES CONCERNING THIS COURSE. No exceptions will be made

(1) **You are expected to take all the exams (midterms and final).** If you miss one of the midterm exams for a documented medical reason, the weight of that exam will be transferred to the final (thus the final will have a weight of 65%). **If you miss two midterms or the final you will not pass this class.** At best you will get a grade of "Incomplete"; note that an Incomplete can only be given when there are documented medical reasons and when the work submitted up to that point is of "**passing quality**" (which will be taken to mean "**C− or better**"). In order to have a justified absence from an exam **you need to inform me before the scheduled time of the exam and you need to produce a medical certificate.**

(2) The dates of the midterms and final for this course are given above. **Nobody will be allowed to take early examinations or later ones.**

(3) **I do NOT grade "on the curve".** I believe that your grade should reflect entirely what *you* have learned. Grades will be determined according to the scale below. Thus, in principle, everybody in the class could end up with an A. In the past the mean of each exam has been in the range 65-75.

score	100-98	97-93	92-88	87-83	82-78	77-73	72-68	67-63	62-58	57-53	52-48	47-43	42-0
grade	A+	A	A−	B+	B	B−	C+	C	C−	D+	D	D−	F

(4) **What method should I use to study?** Typically this is a question that I am asked a week or so before the final by students who are failing the class. Thus not a serious question! If, on the other hand, this *is* a serious question that you are asking **at the beginning of the Quarter**, then here is the answer. **(1)** Your should come to class every time. **(2)** Each week (even better: after every class) you should review the notes you took that week, do the relevant reading and then try the relevant exercises in the textbook. I repeat that it is **essential** that you go through the exercises in the textbook in order to be well prepared for the exams. **(3)** Spend at least 9 hours a week on this class (including attendance to lectures).

PLEASE NOTE ALSO THE FOLLOWING:

(a) ACADEMIC DISHONESTY POLICY. In order to protect the integrity of a UC Davis degree and reward the honest students, academic dishonesty of any kind will not be tolerated. This includes using cell phones or notes during exams, copying or looking at another student's exam during the exam period, talking during exams or turning in work that was not originally generated by you and only you. I expect strict adherence to the Code of Academic Conduct at all times (http://sja.ucdavis.edu/cac.html). My policy is to refer all violations of the Academic Code to Student Judicial Affairs for discipline and impose the strictest sanctions.

(b) The purpose of my and the TA's office hours is to *complement* classes and your individual study. When you come with a question you are expected to have spent some time thinking about it and to **have made some effort**. *At the very least* you must have read the relevant chapter in the book.

(c) *The only reason accepted by the Administration for a grade change is a mistake ("clerical error") in grading.* I am not allowed to make any other changes (e.g. to change a C into a D so that you can take the class again). So please don't ask me to do what I cannot do.

(d) "Dear Professor Bonanno, I am very concerned about my grade in 106 ….". Do you know how many messages like this I get a week or two before the Final? *Please take responsibility for your performance in the midterms.* Note that there will be **no opportunity to do extra credit work to compensate for poor performance in the midterm exms** (a popular request is "can I write a paper?"; my answer is "a paper about what?!"; no paper, no extra credit of any sort).

> A special message to **graduating seniors**: do not come to me after the Final pleading for a C (or a B or whatever) on the grounds that this is your last class and if you don't pass it you will have to re-register for one more Quarter and you cannot afford that, and your lease is expiring, and you have a job but you will lose it if you don't start immediately, and your family will kill you and your spouse-to-be will call off the wedding and ... You know **now** that this is your last class, so start studying **now**!

COURSE OUTLINE

1. What is rationality?

Causal relationships and the framing of choice problems. Subjective versus objective rationality. Framing effects.
Recommended viewing: 1. Dan Arieli, Are we in control of our own decisions?
(https://www.ted.com/talks/dan_ariely_are_we_in_control_of_our_own_decisions)
2. Dan Gilbert, Why we make bad decisions (https://www.ted.com/talks/dan_gilbert_why_we_make_bad_decisions)

2. Choice under certainty

Preferences and the definition of rationality. Representation of rational preferences. Ordinal utility.
Reading: Textbook Chapter 2.

3. Choice under uncertainty: state and acts

Representing decisions in terms of outcomes, states and acts. Definition of strict and weak dominance. Maximin, Maximax and Leximin choice rules.
Reading: Textbook Chapter 3.

4. Choice under uncertainty: decision trees

Decision trees. Money lotteries and expected value. Backward induction under risk neutrality.
Reading: Textbook Chapter 4.

5. Expected Utility

Money lotteries and attitudes to risk. Lotteries with general outcomes. Axioms and representation theorem.
Reading: Textbook Chapter 5.

6. Applications of Expected Utility

States and acts revisited. Decision trees revisited. Regret. The Hurwicz index of pessimism.
Reading: Textbook Chapter 6.

7. Conditional reasoning

The natural frequencies approach. Conditional probability and Bayes' rule. Simpson's paradox
Reading: Textbook Chapter 7.

8. Information and beliefs

Uncertainty and information. Updating beliefs. Belief revision. Information and truth.
Reading: Textbook Chapter 8.

9. The value of information

The value of perfect information and risk attitudes. The general case.
Reading: Textbook Chapter 9.

10. Intertemporal choice

Decisions over time. Impatience. Exponential discounting. Hyperbolic discounting. Time consistency.
Reading: Textbook Chapter 10.

11. Group decision making: Part 1

Aggregation of preferences and Arrow's theorem.
Reading: Textbook Chapter11.

12. Group decision making: Part 2

Strategic issues in group decision making.
Reading: Textbook Chapter 12.

13. The psychology of decision making

The decoy effect. Gains versus losses. Framing. The confirmation bias.
Reading: Textbook Chapter 13.