University of California, Davis -- Department of Economics

Syllabus for Economics 103
Economics of Uncertainty and Information

WINTER 2024   Professor Giacomo Bonanno

1108 Social Sciences, gfbonanno@ucdavis.edu

Classes: Monday, Wednesday and Friday, 12:10-1:00 pm, STORER 1322

Office hours: Thursday, 10:30am-12:00pm and 1:30-3:00 pm

First Midterm exam:	Friday, January 26
Second Midterm exam:	Friday, February 9
Third Midterm exam:	Friday, March 1
Final Exam:	Thursday, March 21, 6:00–8:00pm

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 9 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***: (1)** ECN 100 or (ECN 100A, ECN 100B) or (ARE 100A, ARE 100B), **(2)** (MAT 016A or MAT 017A or MAT 021A) and (MAT 016B or MAT 017B or MAT 021B). If you have an aversion to, or difficulties with, abstract reasoning this course is **not** for you. To be successful in this course you need to be able to think logically and to have an inclination for mathematical reasoning.

Textbook: Giacomo Bonanno, *Uncertainty, Risk and Information*, 2019 (the PDF version is available for free, the printed version is available from Amazon.com for $22; see: http://faculty.econ.ucdavis.edu/faculty/bonanno/URI_Book.html).

Web Page: http://www.econ.ucdavis.edu/faculty/bonanno/teaching/103/. On the web page you will find homework problems, practice exams with answers, etc.

Homework. There will be **5 Homework problems** *which can be downloaded from the web page*. For each problem set the due date is given on the web page. Homework submission is through Canvas. Homework will be graded as follows. Not submitted: 0 points. Fails to understand basic concepts: 1 point. Understands basic concepts but makes several mistakes: 2 points. Good: 3 points (some mistakes, but not serious ones). Very Good: 4 points (essentially no mistakes).

Exams and Grades: there will be **three** 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: 5% on the Homework (scaled to 100), 20% on each midterm and 35% on the Final. **I do NOT grade "on the curve"** (see table on the next page). For example, suppose that your scores are: (1) Homework 16 (out of 20), (2) First Midterm 72 (out of 100), (3) Second Midterm 68 (out of 100), (3) Third Midterm 76 (out of 100), (4) Final 84 (out of 100). Then your class score is:

$$\frac{5}{100}\cdot\left(\frac{16}{20}\cdot 100\right) + \frac{20}{100}\cdot(72) + \frac{20}{100}\cdot(68) + \frac{20}{100}\cdot(76) + \frac{35}{100}\cdot(84) = 76.6$$

which corresponds to a grade of B− (see table on the next page).

Practice Problems: in the textbook you will find 150 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 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 55%). **If you miss two midterms or the final you will not pass this class.** 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.** Note that a grade of Incomplete can only be given when there are documented medical reasons and when the work submitted up to that point is of passing quality (these are the rules at UCD).

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

(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 table 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 yourself **at the beginning of the Quarter**, then here is the answer. **(1)** You 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 studying for this class.

PLEASE NOTE ALSO THAT:

(a) 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 material on the web page.

(b) *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. change a C into a D so that you can take the course again). So please don't ask me to do what I cannot do.

(c) "Dear Professor Bonanno, I am very concerned about my grade in 103 ….". 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 exams.*

> A special message to **graduating seniors**: do not come to me after the Final pleading for a C (or a B or a D 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**!

(d) ACADEMIC DISHONESTY POLICY. In order to protect the integrity of a UC Davis degree and reward the sincere efforts of my 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. Be sure you read it and understand it at 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.

COURSE OUTLINE
(the numbering for Topics 1-7 corresponds to the chapters in the textbook)

1. Introduction

2. General concepts

Money lotteries, expected value, attitudes to risk. Certainty equivalent and the risk premium. Insurance markets, graphical representation of insurance contracts, isoprofit lines. Profitability of insurance contracts.

Reading. Chapter 2 of the textbook.

Practice problems: all the exercises in Chapter 2 of the textbook.

3. Expected utility theory

Reading. Chapter 3 of the textbook.

Practice problems: all the exercises in Chapter 3 of the textbook.

4. Money lotteries revisited

von Neumann Morgenstern preferences over money lotteries. Measures of risk aversion. Some noteworthy utility functions. First-order and second-order stochastic dominance.

Reading. Chapter 4 of the textbook.

Practice problems: all the exercises in Chapter 4 of the textbook.

5. Insurance: Part 2

Binary lotteries and indifference curves. The demand for insurance. Choosing from a menu of contracts. Equilibrium in insurance markets. Mutual insurance.

Reading. Chapter 5 of the textbook.

Practice problems: all the exercises in Chapter 5 of the textbook.

6. Optimal Risk-Sharing and Efficiency

The Principal-Agent relationship when effort is observable and verifiable. Attitudes to risk and Pareto efficiency.

Reading. Chapter 6 of the textbook.

Practice problems: all the exercises in Chapter 6 of the textbook.

7. Adverse selection: Part 1

Adverse selection in markets other than insurance markets

Reading. Chapter 7 of the textbook.

Practice problems: all the exercises in Chapter 7 of the textbook.

8. Adverse selection: Part 2

Adverse selection in insurance markets. Two types of customers. The monopolist under asymmetric information. A perfectly competitive insurance industry.

Reading. Chapter 8 of the textbook.

Practice problems: all the exercises in Chapter 8 of the textbook.

9. Signaling

The choice of education. Signaling in the job market.

Reading. Chapter 9 of the textbook.

Practice problems: all the exercises in Chapter 9 of the textbook.

10. Moral hazard in Insurance

Moral hazard or hidden action. Two levels of unobserved effort. The reservation utility locus. The profit-maximizing contract for a monopolist.

Reading. Chapter 10 of the textbook.

Practice problems: all the exercises in Chapter 10 of the textbook.

11. Moral hazard in Principal-Agent relationships

The Principal-Agent relationship when effort is not observable. Conflict between incentives and risk-sharing.

Reading. Chapter 11 of the textbook.

Practice problems: all the exercises in Chapter 11 of the textbook.