PROFESSOR BURKHARD C. SCHIPPER

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Economics 122 – Game The☺ry

Syllabus Fall Quarter 2021 (version 2021/09/20)

WELCOME!

This course is probably one of the most interesting but also most challenging courses in undergraduate economics. Game theory is the foundation for almost all modern economic theory. It is also applied to computer science, evolutionary biology, political science, philosophy, psychology, military science etc. Game theory is the mathematics of interaction between humans, firms, machines, animals, genes, countries, etc. studying the phenomena of conflict and cooperation. Mathematics is not learned by listening or reading. This means that besides participating in the lectures, you will have to do "learning by doing" through lots of homework and your participation in section meetings. In lectures, I will discuss game theoretic concepts. In the homework, you should independently apply these concepts to novel problems. TAs will discuss examples and solutions to the past homework during section meetings. You should drop this course if you are not willing to engage in independent hard work or if you are allergic to mathematical reasoning. This course is cross-listed with computer science.

This course is taught **in-person** just like before the Covid-19 pandemic. The only difference is that we must always follow current **Covid-19 health guidelines** https://campusready.ucdavis.edu/ including wearing a mask in class etc.

LECTURE TIME AND PLACE

Tuesdays, Thursdays, 9:00 – 10:20 am, GIEDT 1002

SECTION MEETINGS

Our teaching assistants will review problems of previous homework, discuss examples, refresh some essential mathematical tools, and discuss your questions. They are not authorized to help you on the graded homework (since I want to grade you instead of my TAs).

CRN:	Section:	Day:	Time:	Location:	TA:
30268	A01	Tuesdays	6:10 - 7:00pm	WELLMN 201	Keisuke Teeple
30369	A02	Tuesdays	7:10 - 8:00pm	WELLMN 201	Keisuke Teeple
30370	A03	Thursdays	6:10 - 7:00pm	GIEDT 1006	Kepler Illich
30371	A04	Thursdays	7:10 - 8:00pm	GIEDT 106	Kepler Illich

HOMEWORK

The (almost weekly) homework must be submitted by **TBA**. The deadline is firm and there are no exceptions. There will be lots of graded and practice homework. Independent problem solving is an integral part of the course. We will not distribute the solutions to homework in print nor will they be posted online. Rather, solutions are discussed in sections the following week. There will not be any make-up homework. **No help will be provided for solving graded homework since I want to grade you and not my TAs.**

EXAMS (in person)

Midterm Exam 1:   Thursday, October 28, 2021, in class

Midterm Exam 2:   Friday, November 23, 2021, in class

Final Exam: Thursday, December 09, 6:00 pm

GRADING

Homework: 1/9 of your final grade. Your 3 lowest graded problem sets will be dropped.

Midterm Exams: 4/9 of your final grade. The lowest midterm will be dropped.

Final Exam: 4/9 of your final grade.

There are no make-up exams or homework.

ACADEMIC CHEATING

Cheaters will endure public humiliation in a pillory in front of the MU every Wednesday at noon.[1] For details, see the Code of Academic Conduct at UC Davis: http://sja.ucdavis.edu/files/cac.pdf

NEED FURTHER HELP?

Teaching Assistant:

Keisuke Teeple   T 2:00 – 4:00 pm   SSH 134   kwteeple@ucdavis.edu

Kepler Illich   TBA   mkillich@ucdavis.edu

Professor:

Burkhard C. Schipper   R 1:30 – 2:30 pm   SSH 1106   bcschipper@ucdavis.edu

                       or by appointment

COURSE HOMEPAGE

Information on grades you can find on canvas. I hate canvas. For all other stuff, we will be using Piazza. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. Find our class signup link at: https://piazza.com/ucdavis/fall2021/ecn122

I explicitly encourage all to discuss **graded** and practice homework. However, you should not outright tell your answers to graded problems to others. You can give hints, suggest approaches to finding a solution, and guide others' thoughts. Note that you can easily include math formulas and pictures into your post.

You will receive an invitation to join by email. If you have not received an invitation by Friday, September 24, 2021, check your spam folder or write me an email.

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[1] For people lacking humor: I am just kidding. It is not a laughing matter though. By the way, there are many game theoretic issues here: What is fairness? Is punishment efficient? Is there something like "optimal" enforcement? Is there something like "optimal" punishment? Should punishment be public or private? Do exogenous disincentives like punishment crowd out intrinsic moral values? …

PREREQUISITES

Mathematics 16A and 16B or 21A and 21B with a grade of a C- or better in each course are prerequisites. Prerequisites on your personality include an open mind for learning abstract mathematical reasoning, the ability to enjoy solving problems, and readiness for persistent hard work. You should drop this course if you do not satisfy the prerequisites.

TEXTBOOK

Osborne, Martin J. (2004). An introduction to Game Theory, Oxford University Press.

I put three desk copies on reserve in the library. Do not buy a new copy. It cost you a fortune. Buy a second hand copy online (our bookshop is too expensive).

There is also a very nice book by my colleague, Giacomo Bonanno, available free-of-charge online:

Bonanno, Giacomo (2018). Game theory, 2nd edition, http://faculty.econ.ucdavis.edu/faculty/bonanno/GT_Book.html

PRELIMINARY COURSE OUTLINE

Introduction
What is game theory? (Chapter 1)
Games with perfect information
Games in strategic form, Dominance, and Nash equilibrium (Chapters 2 & 3)
Mixed strategies (Chapter 4)
Games in extensive form (Chapters 5, 6 & 7)
Coalitional games (Chapter 8)
Games with imperfect information
Bayesian games (Chapter 19)
Extensive games with imperfect information (Chapter 10)
Additional Topics
Strictly competitive games (Chapter 11)
Rationalizability (Chapter 12)
Evolutionary Stability (Chapter 13)
Repeated games (Chapters 14 & 15)
Bargaining (Chapter 16)
Fair Division

Unfortunately, we will not be able to cover all topics above. I will decide which topics I will drop/cut short later in the quarter depending on how quick we will progress.