

# Markets & Behavior

## ECON 510-001

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Department of Economics  
University of North Carolina

Fall, 2019



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

# Outline



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# Course Objectives

Our main learning goals are to acquire tools to:

- 1 construct models of micro-economic behavior,
- 2 identify their (built-in) limitations and
- 3 think critically about how to apply them to real-life.
- 4 write a research essay/proposal/project



## On Exactitude in Science

Jorge Luis Borges, *Collected Fictions*, translated by Andrew Hurley.

“In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and that they delivered it up to the Incumbents of Holy and Wisdom, in the Desert of the Teares, all together they decided that they would not make any more Maps, and that they would invent a Tax which should render the Trade of Cartography useless for ever. There were no other Means of the Expansion of Cartography.”

Suarez Miranda, *Viajes de varones prudentes*, Libro IV, Cap. XLV, Lerida, 1658.”



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and they destroyed it. They then made another Map, smaller than the first, which represented the Empire as a square, and the square was divided into provinces. This second Map was still less liked, and they made a third, which was still smaller, and still more like the Empire, but this was too small, and they made a fourth, and a fifth, and finally a very small Map, which was almost like the Empire, but which was so small that it could be put in the pocket of a traveler. This last Map, which was the most useful of all, was the last that was made. In the course of time, however, the Empire was divided into smaller and smaller provinces, until there were no more provinces left, and the Empire was a mere point, and the Map was a mere point, and the Map was destroyed.”

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# Mont Sainte Victoire

## Photography vs Cézanne



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## Required Book

Rajan, Raghuram

Fault Lines: How Hidden Fractures Still Threaten the World Economy,  
any edition.



## Reaching Our Goals

- In this course, we will read and discuss Rajan's book "Fault Lines" in order to be exposed to real-life, contemporary, economic issues.
- However, as "Fault Lines" is intended to a general audience, it lacks any explicit economic modeling.
- Most of this course will be devoted to studying the microeconomic models covered in our lecture notes, which we will then apply to some of the topics discussed in "Fault Lines".
- We will learn how to use computer algebra package, Mathematica, which will be an indispensable tool.



# Tentative Coverage

- 1 Mathematics: Taylor's rule and the Chain Rule
- 2 Review: Consumer Theory with Many Goods
- 3 Review: Expected Utility Theory
- 4 General Equilibrium
- 5 Financial Markets
- 6 Overlapping Generations
- 7 Pareto Efficiency
- 8 Nash Equilibrium
- 9 Search Theory
- 10 Bank Runs

# Research

- Econ 510 is a research-intensive course.
- Research readings and assignments will be posted weekly on Sakai.
- Students will work on a final research project. The topic of the project will be on “student loans”.

## Class Information

- We meet Tuesdays and Thursdays, from 11 am to 12:15 pm, at Bingham hall, room 0101.
- Whenever possible, please bring your laptop loaded with Mathematica to class.
- Sakai will be used to schedule office hours meetings, post grades, course announcements, readings, supplementary materials, messaging, problem sets, etc...

## Contact Info and Office Hours

- ① Email: [sergiop@unc.edu](mailto:sergiop@unc.edu).
- ② Please, use Sakai messages instead of regular email.
- ③ Office hours (OH) are by appointment only:
  - Wed: 3–4 pm,  
Fri: 10–11 am,  
.
  - To schedule an OH meeting use Sakai > Sign-up.
  - Do not hesitate to email-me to schedule meetings **outside** regular OH if your schedule conflicts with the regular OH.



## Evaluation

- **September 10th** — 1st Midterm
- **October 10th** — 2nd Midterm
- **December 12th, Thursday at 4 pm** — Final Examination
- Midterm grades account for 35% of the final grade.
- Final examination grade is worth 35% of the final grade.
- Ten or more problem sets and/or research readings: 20%.
- Final Research Project: 10%.
- The weight of any missing midterm (with justification) is transferred towards the final exam.

## Computing Grades

- Exam grades are converted into scores accordingly to:

$$\text{Score} = \text{Exam Grade} + 100 - \max(\text{Top Exam Grade}, 50).$$

- Assignments scores are identical to assignment grades.
- Course grades are computed accordingly to the table:

letter grade	min. score
A	95
A-	90
B+	87
B	83
B-	80
C+	77
C	73
C-	70
D+	67
D	63
F	50

## To do list for the first week

- 1 If you are eligible for taking exams with Accessibility Resources, please schedule with them within the first or second week of classes and notify me.
- 2 If a) you have more than 3 final exams in more than 24 hours; b) ECON510 is one of these exams; and c) you wish to re-schedule one of your exams; then you **MUST** ask for an alternative date before the second week of classes. If you do not follow these procedures your request will not be accommodated.
- 3 Place an order for the software *Mathematica* throughout [software.sites.unc.edu/software/mathematica/](http://software.sites.unc.edu/software/mathematica/). The *student license is free*. However, you must place an order.

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## Class Discussion

During this course, we shall employ additional material from TV, movies, or literature to discuss strategic related issues.

Sometimes, you may find the political or religious views; or the profanity contained in the additional material offensive or objectionable and you may feel uncomfortable.

I **do not** endorse any particular views ex but ...

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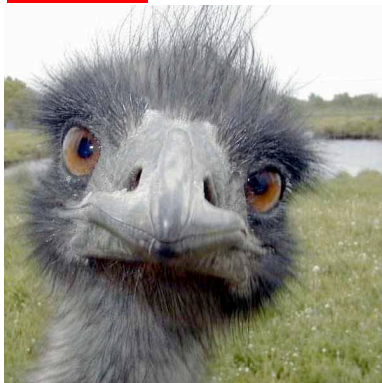
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## Class Discussion

I believe that as part of your **university** education, it is important you



engage in **critical thinking**, while respecting different opinions expressed by your classmates. I will strive to maintain a welcoming and inclusive environment even when we discuss uncomfortable topics.

## Real-life Applications

To discuss real-life applications, it is recommended that you read at least one newspaper regularly, follow major current events and pay special attention to economic relevant events. Moreover, if you are

heading to graduation and the job-market I suggest you follow a major newspaper such as the New York Times or Wall Street Journal.

Another good source of economic news is the NPR podcast [Planet Money](#).

# Assignments

- 1 Assignments are posted on Sakai.
- 2 Past due assignments are not accepted without proper justification.
- 3 Please be prepared to present and discuss the PS.
- 4 You are **strongly** encouraged to work in groups of at most four. In this case, please submit only one copy.
- 5 The grading criteria for the PS are:

grade	solutions	work	presentation
4.0	correct	explained	reasonable
3.5	comput. err.	explained	reasonable
3.0	concept. err.	explained	reasonable
2.0	–	omitted	reasonable
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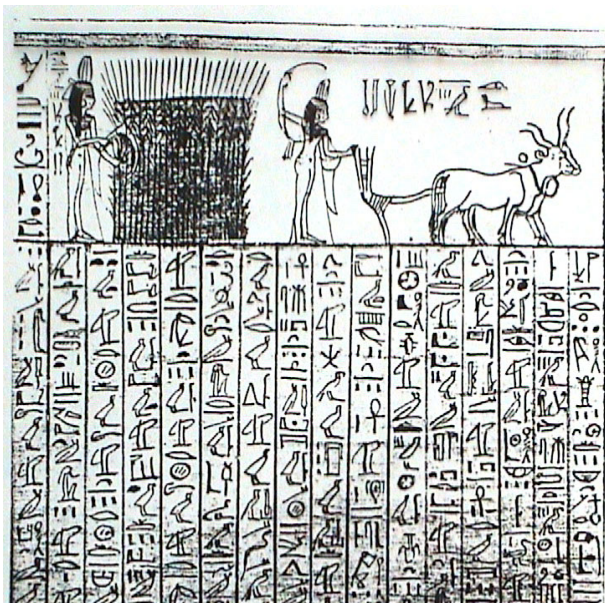


## Some words about math.

We will cover bits of optimization, set theory and proof reasoning but I assume you have knowledge equivalent to Osborne's (suggested reading) mathematical appendix – please browse it – and please, do report any doubts or questions to me as soon as possible I can help you. Or check topics 1 to 2.3 in [Martin Osborne's tutorial](#).

- Language of Set Theory
- Basic Calculus (derivation and integration).
- Probability (expectation of random variables)
- Reading Proofs.
- Finding Maxima and Minima.

# Mathematics is a tool (language)



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If  $f : [a, b] \rightarrow \mathbb{R}$  satisfies  $[\forall x \in [a, b]$  and  $\forall \varepsilon > 0, \exists \delta > 0$ ; such that  
 $|x - y| < \delta \Rightarrow |f(x) - f(y)| < \varepsilon]$   
 $\Rightarrow \exists z \in [a, b]; \forall x \in [a, b] f(z) \geq f(x)$ .

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## Questions & Answers

*I understand the lecture notes but during the exams I am not able to answer the questions. What am I doing wrong? How should I study for this class?*

The only way to make sure you understood the material is to solve problems. Try to work in groups and try to solve as many problems as you can. Do not be frustrated if you get stuck with a problem. The problems where you get stuck are precisely the ones that are useful for your study. They should serve as a guide to where the focus of your reading should go and to which questions you should bring to class.

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The point of solving problems is not to come up with a right answer but rather to elicit questions that you may have about the material. If you are unsure about your work or answer this is good signal. Please do bring the problem to class and express your doubts. If you faced a challenge when trying to solve a problem and you are not sure of your answer or not sure on how to proceed at some step, chances are, your colleagues have similar questions and it is worth to discuss it in class.

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This course is the only one that fits my schedule.  
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It depends on your degree of risk-aversion. The variance of grades sometimes is high.

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## Is this course useful? for an Econ PhD

*I want to go to grad. school in Economics. Microeconomic Theory is very important for Economics, should I take this course?*

No. In grad school, you will have several opportunities to take Microeconomic Theory classes. If you want to increase your chances of being accepted by a top program, you should take more classes at the Mathematics Department.

## Is this course useful?

### Econ and other fields

*Would you recommend this course to any Econ, CS or Poli Sci major or PPE minor?*

Of course: if you want to learn more about when markets work (or fail), this is a good course for you. If you plan to go to Law School, grad school in Public Policy, Political Science, etc ... or if you just want to learn for the sake of learning, this is a terrific course for you.

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Chances are, you will not write down a model for some concrete real-life situation, solve for its equilibrium and make accurate predictions based on it. But that does not mean that models are useless. Economic Theory may help you avoid real-life pitfalls. Also check this Noah Smith's article for several interesting examples of applications of Microeconomics to real-life.

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