

## Syllabus

### Advanced Topics in Cognitive Science: Behavioral Game Theory

01: 185: 414

#### Logistics

- Professor: Dr. Mary L. Rigdon
  - Email: [mrigdon@rutgers.edu](mailto:mrigdon@rutgers.edu)
  - Office Hours: TBA and by appointment [Zoom link](#) [password:rigdon]

#### An Important Note from Snoop Dogg on the Syllabus

[Snoop Dogg says "Read the syllabus!"](#)

#### Course Description

The course presents advanced topics in behavioral / experimental game theory and designed to develop theoretical and experimental tools. Owing to the limitation of time, the topics covered will necessarily be only a small fraction of what one could (and ideally, should) cover in this course, and thus, the course cannot provide a complete coverage of the vast and growing body of work on behavioral / experimental game theory. Experimental economics has become a major area of research in economics. Its basic premise is that all good economic theories can be testable in a controlled laboratory setting. In fact, one may argue that some economic theories can only be tested experimentally. The course will also survey some classics of experimental game theory and discuss some of its recent developments. The course will not about experimental methods per se. We will analyze choices that decision makers make in the lab and in the field and try to explain these choices with economic models. We will enrich the standard game theoretic models by incorporating psychological mechanisms, including limited rationality, limited selfishness, and limited self-control. The pre-requisite is 185:201 'Introduction to Cognitive Science'. This course counts for 3 credits.

#### Course Objectives

- Develop scientific and critical reasoning skills
- Understand different types of games and their uses in strategic thinking.

- Use a variety of tools to find equilibria.
- Learn how and why behavior differs from game-theoretic predictions.
- Understand how behavioral game theoretic models differ from standard accounts.
- Understand the way in which game theoretic models can be applied to a variety of real-world scenarios.

## Textbook

There is no textbook for this course. Readings consist of articles written on topics in Cognitive Science and chapters from edited books and textbooks. The required readings will be available on Canvas for you to download. There are also optional readings that may be helpful or interesting if you find yourself wanting to read more about that topic. **Do not skip or skim the required readings. Be sure to read them ahead of the lecture/discussion.**

## Class Meetings and Labs

**Class:** Each week Wednesdays 12-1pm

**Labs:** Wednesdays 1-1:30/1:45pm on following dates (subject to change):

Jan 27; Feb 3, 10, 17; Mar 3, 10, 24

- [Zoom link for classes and labs](#) [password: BGT]

Zoom link and password also available on Canvas under Modules and Pages.

NOTE: Attending class and participating in the experiments is not required, but strongly encouraged if you can attend because (1) we have fun! (2) you will learn more from attending and participating in labs, and (3) it will make completing the lab assignments more straightforward.

## Experimental Software: MobLab

We will be conducting class experiments using online experimental software, MobLab. Please do this before the next class session as we will have our first experiment! There is a small license fee to be paid by you: \$25 per student.

To Register: Go to [www.moblab.com](http://www.moblab.com), click 'Sign Up' to sign-up for a Student Account. You can also download the MobLab iOS or Android app and create your student account through the app.

IMPORTANT: To facilitate record-keeping, use your university email address.

To Join the Class: Using a browser or the MobLab app, sign into the Student Console. Choose Join a Class and enter our Class Code:

**zz6s99hw3**

In the resulting popup, you will be prompted for the student fee which is payable by credit card. Once your payment is processed, you should have confirmation that you have joined our class.

To participate in MobLab games you need an internet-connected device. Laptop users can use any browser. I strongly recommend that iOS (iPhone and iPad) and Android users use the MobLab app downloadable from the device's app store. Trust me, the app is so much better for playing on handheld devices!

Please read the MobLab guide that is available on Canvas for information about participating and playing games. Any questions or run into issues: please email [support@moblab.com](mailto:support@moblab.com)

## Evaluation

There will be a total of 1000 points possible in this course.

- Short Analytic Assignments (75%) (750 points): You will complete five critical/analytic take-home assignments related to the in class laboratory experiments, worth 150 points each. Please submit these via Canvas under Assignments in **.pdf** form. The schedule lists the due dates for each assignment. Every day that an assignment is late will result in an automatic one-grade reduction. NOTE: You may work in groups of up to 4 people and submit one set of answers with names of all contributors listed; everyone in the group will receive the same grade.
- Exam (25%) (250 points): There will be a take home final exam due via Canvas in .pdf on May 7 by 8am. **NOTE: The take home exam is to be your own work.** It will cover the topics from the entire term. There will be 6 short answer questions and an extra credit question. I will post the questions on Canvas at least one week ahead of the due date.
- Extra Credit Option: A number of researchers in Linguistics conduct experiments that are relevant to the material covered in this class. You have the opportunity to participate in up to 3 experiments in Linguistics for 3 points for each experiment, added onto your final grade. Information for accessing the subject pool is available on Canvas under PAGES. You must select one course to designate as the one for which you will receive the credit. Note: you can only select one course and that will be the one in which you receive the extra credit points. I will be notified about your participation automatically at the end of the semester. If you sign up for, but fail to show up for two or more experiments, you may be barred from further participation.

## Technological Requirements

Please visit the [Rutgers Student Tech Guide](#) page for resources available to all students. If you do not have the appropriate technology for financial reasons, please email Dean of Students [deanofstudents@echo.rutgers.edu](mailto:deanofstudents@echo.rutgers.edu) for assistance. If you are facing other financial hardships, please visit the [Office of Financial Aid](#).

Any live lectures, all recitations, and all office hours will be conducted using **Zoom**. You do not need to purchase any software to join a meeting or a videocall. Basic information about Zoom can be found [here](#):

- <https://zoom.us/meetings>

You can join a meeting or videocall by either downloading (free!) the Zoom app or by launching it in a browser.<sup>1</sup> You can sign up for a free Zoom account if you want to, but it isn't necessary.<sup>2</sup>

NOTE: Class meetings and labs on Zoom (including video, audio, and chat text) will be recorded.

An important note about video: Please turn on your video when possible. It is helpful to be able to see each other, just as in an in-person class. Exceptions: If you have limited internet bandwidth or no webcam, it is ok to not use video or if you're unable to find an environment without a lot of visual distractions, it is also ok to turn off your video.

Please make use of the next few days to see what set-up works for you. Please learn how to unmute yourself and also turn on your video. I can't promise that things will always go smoothly (e.g. I hear that this week Zoom had massive outages as schools resumed classes), but I will try my best to have things run as smoothly as can be expected under the circumstances.

## Email Etiquette

The following webpage "Email Etiquette: Guidelines for Writing to Your Professors" created by Dr. Mark Tomforde is required reading for the course:

<https://www.math.uh.edu/~tomforde/Email-Etiquette.html>

## Trying Our Best During a Global Pandemic

You are trying to learn — and I am trying to teach — during a global pandemic. If we are lucky, all that will mean for us is that the semester will be more stressful than usual. I'm usually pretty strict for basically everything related to my courses, and I usually hold myself to the same high standard that I hold my students. For example, I expect things turned in on time and in return we grade material and get it back to students quickly. But seriously, there is a global pandemic going on. So let's just agree that we will all try our best. I will cut you some slack, and I expect you to cut me some slack, provided that we communicate with each other about our needs and constraints. (used with permission from Ryan Briggs @ryancbriggs)

## Rutgers Policy on Academic Integrity

Rutgers has a very detailed policy on Academic Integrity and Code of Student Conduct: <http://nbacademicintegrity.rutgers.edu/home/academic-integrity-policy/>. Violations include cheat-

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<sup>1</sup>I have read that it is more stable in Chrome.

<sup>2</sup>Possible benefits of signing up for a free account: you can host your own video chats to work on discussion questions with others, you can join a meeting from your phone, stay connected with friends and family, etc.

ing, fabrication, plagiarism, denying information to or misleading others, or facilitating these violations.

## **Students with Disabilities**

The University is committed to providing students with documented disabilities equal access to all University programs and facilities. If you think you have a disability requiring accommodations, you must register with Office of Disability Services (ODS): <https://ods.rutgers.edu>.

If you have received an Accommodation Letter for this course from ODS, please provide me with that information privately so that we can review those accommodations.

## **Rutgers' Learning Centers**

Rutgers' Learning Centers “provide centralized academic support services to cultivate students’ skills, strategies, and behaviors that lead to academic persistence and lasting success.” Services available include peer tutoring, academic coaching, writing coaching, and study groups.

<https://rlc.rutgers.edu>

## **Get Involved with Cognitive Science Club!**

Find information on the exciting events being organized by the Cognitive Science Club:

<http://ruccs.rutgers.edu/academics/cogsci-club>.

Like them on Facebook to get updates: <https://www.facebook.com/RUCogSciClub>

## **Student-Wellness Services**

**Just In Case Web App** <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

**Counseling, ADAP & Psychiatric Services (CAPS)** (848) 932-7884

17 Senior Street, New Brunswick <http://www.rhscaps.rutgers.edu>

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students’ efforts to succeed at Rutgers.

**Violence Prevention & Victim Assistance (VPVA)** (848) 932-1181

3 Bartlett Street, New Brunswick <http://www.vpva.rutgers.edu>

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty.

**Disability Services** (848) 445-6800 <https://ods.rutgers.edu>

Rutgers welcomes students with disabilities into all of the educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the office,

participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>.

**Scarlet Listeners** (732) 247-5555 <http://www.scarletlisteners.com>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.

## Tentative Schedule\*\*

| Date     | Topic                                                      | Readings                                                                                                                                |
|----------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| January  |                                                            |                                                                                                                                         |
| 20       | Introduction                                               |                                                                                                                                         |
| 27       | Background on Game Theory                                  | <a href="#">Gibbons (1997)</a> thru Nash Eq                                                                                             |
| February |                                                            |                                                                                                                                         |
| 3        | Overview BGT <a href="#">[EXP]</a>                         | <a href="#">Gächter (2004)</a>                                                                                                          |
| 10       | Coordination Games <a href="#">[EXP]</a>                   | <a href="#">Dixit, et al. (2015)</a> , Ch 4                                                                                             |
| 17       | Coordination Games II - Sustain Coop <a href="#">[EXP]</a> | <a href="#">Axelrod (1984)</a> , Ch 1-2                                                                                                 |
| 24       | Extensive Form Games                                       | <a href="#">Watson (2013)</a> , Ch 14-15                                                                                                |
| March    |                                                            |                                                                                                                                         |
| 3        | Experimental Economics <a href="#">[EXP]</a>               | <a href="#">Camerer (2003)</a> Appendix 1.2; <a href="#">Friedman &amp; Cassar (2004)</a> <b>Assign #2</b>                              |
| 10       | Charitable Giving <a href="#">[EXP]</a>                    | <a href="#">Andreoni and Payne (2013)</a>                                                                                               |
| 17       | SPRING BREAK                                               |                                                                                                                                         |
| 24       | Public Goods <a href="#">[EXP]</a>                         | <a href="#">Holt (2019)</a> , Ch 16; <a href="#">Gumthorsdottir, et al. (2007)</a>                                                      |
| 31       | Investment Game                                            | <a href="#">Chaudhuri (2008)</a> , Part 3; <a href="#">McCabe, et al. (2007)</a> <b>Assign #3</b>                                       |
| April    |                                                            |                                                                                                                                         |
| 7        | Hyperbolic Discounting                                     | <a href="#">Chabris, et al. (2007)</a> ; <a href="#">Mischel, et al. (1989)</a> ; <a href="#">Watts, et al. (2017)</a> <b>Assign #4</b> |
| 14       | Comparative                                                | <a href="#">Capra, et al. (2020)</a> Webster et al chapter                                                                              |
| 21       | Neuroeconomics                                             | <a href="#">Claidière, et al. (2015)</a> <b>Assign #5</b>                                                                               |
| 28       | Power of BE                                                | <a href="#">Thaler and Sunstein (2009)</a> , Ch 1, 12                                                                                   |
| May      |                                                            |                                                                                                                                         |
| 7        | <b>Take home Final Exam due</b>                            | Sam via Canvas as .pdf                                                                                                                  |

\*\* This syllabus represents my current plans and objectives. As we go through the semester, these plans (including exact assignment due dates) may need to change to enhance learning opportunities for the class. (e.g. due to an extension of our discussion of specific topics that arise during lectures). Such changes, communicated clearly, are not unusual and should be expected.

## Bibliography

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