ECON 405: NEUROECONOMICS
University of Southern California
Spring 2023

Schedule: Mon-Wed 10:00 – 11:50 a.m.
Class Location: SOS B4

Instructor: Prof. Giorgio Coricelli
Office Hours: Wed 12:00 p.m.
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web: https://dornsife.usc.edu/coricelli

TA: Francesco Gabriele
e-mail: fg14007@usc.edu
Office Hours: Mon/Wed 8:30-10:00 a.m.

Prerequisites for the course: ECON 303

Textbook: Neuroeconomics, Decision Making and the Brain, 2nd Edition, Edited by Glimcher and Fehr, 2014. Additional readings (see list below) will be uploaded online.

Throughout the course, the primary goals are to:
- Learn about the academic field of neuroeconomics, its major theories, results, and debates
- Become a critical consumer of research findings by learning the methodological standards for evaluating the soundness of such studies
- Develop the ability to effectively write and speak about decision theories, results, and debates
- Acquire some practical skills for designing and analyzing an experiment in the field of neuroeconomics

Description of the course:
The first part of the course will focus on neuroscience as a new lens on decision-making. We will focus primarily on studies of the neural basis of human behavior. This part will include a special focus on (i) the reward system; (ii) reinforcement learning; (iii) the neural basis of choice under risk and uncertainty; (iv) intertemporal choices; (v) preferences and relative rewards; (vi) the role of emotion in decision-making. The second part will focus on (i) Experimental Game theory; (ii) social preferences; (iii) strategic choice; and (vi) neuro-finance
**Problem sets**: Due at the beginning of class on the due date

**Class presentation**: Students will be divided into groups. Students in each group will be assigned a specific topic and a related experimental data set (data from class experiments) to be analyzed to be presented in class.

**Exams**: Two midterms, and a final exam

**Grading**:

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<th>Component</th>
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<td>Problem sets, class presentation and class participation</td>
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<tr>
<td>Midterm 1</td>
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<td>Midterm 2</td>
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<td>Final exam</td>
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**Grade Determination and Final Examination Details**: Tests and final exams are marked on a numerical (percentage) basis, and then converted to letter grades.

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**Course Outline**: The objective of this course is to introduce basic and advanced elements of Neuroeconomics. The topics to be covered and the required readings (Chapters from the Textbook *Neuroeconomics (CH)* and Readings *(R)*) are:

**January**

- Mon 9: Lecture 1: Introduction (CH 1)
- Wed 11: Lecture 2: Experimental methods in Cognitive Neuroscience (CH 5)

*Mon Jan 16 Martin Luther King Jr. Day*

- Wed 18: Lecture 3: The computation of stimulus values in a simple choice I (CH 8)
- Mon 23: Lecture 4: The computation of stimulus values in a simple choice II (CH 8)
- Wed 25: Lecture 5: Neural foundation of economic preferences (CH 8)
- Mon 30: Lecture 6: Reward processing mechanisms I (CH 15)

**February**

- Wed 1: Lecture 7: Reward processing mechanisms II (CH 15). **Problem set 1 assigned**
- Mon 6: Lecture 8: Multiple systems for value learning (CH 21)
- Wed 8: Lecture 9: Summary of lectures 1-8. **Problem set 1 due before class**. Discussion

**Mon 13**

- Midterm 1

- Wed 15: Lecture 10: Decision Theory: Risk and uncertainty I (CH 9)
Mon Feb 20 President Day

Wed 22  Lecture 11: Decision Theory: Risk and uncertainty II (Appendix Prospect theory)

Mon 27  Lecture 12: Neural correlates of Risk and uncertainty I (CH 9, R)

March

Wed 1  Lecture 13: Neuroeconomics of Emotion (CH 12, R)

Mon 6  Lecture 14: Neural basis of intertemporal choice (CH 10).
Wed 8  Lecture 15: Decision Biases in the Brain (CH 24). Problem set 2 assigned

Spring recess March 12-19

Mon 20  Lecture 16: Summary of lectures 10-15. Problem set 2 due before class. Discussion
Wed 22  Midterm 2

Mon 27  Lecture 17: The social brain I (CH 27, R)
Wed 29  Lecture 18: Experimental Game theory (CH 2)

April

Mon 3  Lecture 19 Experimental Game theory II (CH 2)
Wed 5  Lecture 20: Measuring social preferences (CH 11)
Mon 10 Lecture 21: Altruism, Fairness and Trust in economic exchange (CH 11, 25 R)
Wed 12 Lecture 22: The neural Basis of Strategic Choice I (CH 25, R)

Mon 17 Lecture 23: Neural basis of social comparison and social conformity (CH 11, R). Problem set 3 assigned
Wed 19 Lecture 24: Neuro-finance (R)
Mon 24  Class Presentation, day 1
Wed 26  Class Presentation, day 2, & Summary of lectures 18-24. Problem set 3 due before class. Discussion

May

Final exam  Monday May 8, 8-10 a.m.
List of readings (R):
R6. The somatic marker hypothesis: A neural theory of economic decision, by Bechara and Damasio, Games and Economic Behavior, 2002