This course is an introduction to the neuroscience behind the principles of economic decision making. The topics in this course are aimed at exploring the underlying cognitive and neural mechanisms that drive the decisions behind traditional economic models.

Neuroeconomics exposes the underlying motivations for our social behavior, prejudices, biases, opinions, judgements, reactions and decision making. We explain and critically analyze, neurologically and behaviorally, phenomena such as implicit bias which can cause the kind of tensions that impede efforts towards diversity, equity and inclusion in the United States.

There are no required course prerequisites.

**LEARNING OBJECTIVES:**

- Be introduced to behavioral economics and have a basic understanding of traditional and behavioral economic models of decision making.

- Students will understand how emotions, risk, reward and probability factor into decision making and prejudices. By examining the hidden drivers of our snap judgements and behavior towards other people, we focus on African Americans and the effect of implicit biases in law enforcement, healthcare, public interactions and public opinion.

- By understanding how our sense of self is not entirely self-contained but includes aspects of group thinking and identification, often without us realizing it, we critically examine identity as a framework for understanding how we process information about ourselves and about others of similar and dissimilar identity.

- A characteristic of the biases and heuristics of behavioral and neuroeconomics is that they are generally unknown to us, and exposing them and their often irrational nature is important in understanding ourselves, others, and our reactions to others better.

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**CONTACT US**

**OFFICE HOURS & LOCATION**

Boyle: CSB 130  
Tuesday’s @ 2-4pm  
Gladly by appointment.

TA/IA OH: Posted on TritonEd  
mboyle@ucsd.edu

**INFORMATION & MATERIALS**

- [COGS2 CLASS WEBSITE](http://pages.ucsd.edu/~mboyle/COGS2/index.html)
- All required readings are posted on COGS2 CLASS WEBSITE.
- Lecture notes will be posted on COGS2 CLASS WEBSITE shortly before class begins.
- Audio/Video podcasts will be available through UCSD podcast portal.
- Course attendance and participation is encouraged by the use of iCLICKERS during lecture.
- Grades are posted on TritonEd.
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<td>Tools of the trade</td>
<td>Introduction to Neuroeconomics</td>
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<td>Introduction to brain imaging techniques.</td>
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<td>Quick tour of the brain</td>
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One cannot begin to understand and improve social behavior, decision-making, aggression and the implicit biases that underly racism without integrating neuroscience, cognitive science, and behavioral economics.

Students will learn the basics of neuroscience to gain an understanding of the neural imaging technology that is central to the field of cognitive neuroeconomics. The assigned papers show that we make hiring decisions based on our unconscious perception of perceived beauty rather than on our assertion that we make the hiring decisions based on objective work qualifications.

In addition to being unaware of the real motivation (e.g. perceived beauty) underlying decisions, we discuss, throughout the quarter, the importance of environmental cues that effect our decisions. It is well known that habits are formed by repeatedly activating the cue-routine-reward system. Habits are formed in the basal ganglia outside of our conscious awareness. When we live in a society that consistently has cues that are detrimental to a minority group, then one can easily form the habit of making decisions based on the habit formed by being repeatedly exposed to racism bias in the environment.

**Week 1 Readings:**


The Committee for the Prize in Economic Sciences in Memory of Alfred Nobel


*On Introducing Noninvasive fMRI: A Conversation With Ken Kwong*
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<td>2</td>
<td>Thinking Economically</td>
<td>Game Theory, Rewards, Risk Aversion</td>
<td>Immediate rewards; craving; availability; dopamine; orbitofrontal cortex; striatum</td>
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<td>What is rational and irrational behavior?</td>
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COGS2 uses behavioral economics and neuroscience to tease apart the implicit biases within our society today. COGS2 aims to use the methods in both disciplines to expose the pervasive biases deep within our culture associated with racism that leads to social inequality and injustice.

Behavioral economics (BE) utilizes principles of psychology to understand decision-making under the circumstances that are not predicted by the traditional economic models. In this class, we will look at the aspects that underlie decision making that is outside of one’s awareness. We will analyze how our implicit biases are at the root of pervasive racism and inequality within our culture. By studying the underlying neural mechanisms that drive our decision making, we will be able to not only reveal the biases but work toward ameliorating the underlying problems that drive social inequality and racism.

BE is now implemented in public policy in both the UK and US. In the UK, the Behavioral Insights Team (BIT) uses the information gained from BE studies to inform policy and legislative changes (healthcare, tax collection, medical prescription errors).

In US, Obama used “Nudge” principles to direct and guide people’s retirement savings options and energy saving programs. Nudge principles can be used to give access to programs to marginalized communities who may be unaware of available resources and services (e.g. lunch programs; health care).

Students in COGS2 will be introduced to how BE is used by industry and government to implement their marketing programs and achieve public policy goals. This awareness extends our understanding of behavior and the motivations for decision-making that can lead to inequality and social injustice.

**Week 2 Readings:**

Miguel Nicolelis, TED TALK *A Monkey That Controls A Robot With Its Thoughts.*
https://www.ted.com/talks/miguel_nicolelis_a_monkey_that_controls_a_robot_with_its_thoughts_no_really?
language=en&utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare

| 3    | Irrational behavior: when decision-making gets hijacked. | Blame neural circuits for risky decision making: addictions, gambling and video games, Oh my! | Raphe nuclei; serotonin; frontal lobe damage; amygdala; orbitofrontal cortex; striatum. |

During this section, COGS2 students will continue to look at the neurobiology of what may constitute hijacked decision making. The students will see how stimulation of the hypothalamus, medial forebrain bundle and dopamine are central to motivating and driving behavior.

**Week 3 Reading:**
http://digitalcommons.chapman.edu/esi_working_papers/180/
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| 4    | You can’t always get what you want. | The downside of dementia — you cannot plan to get what you want. 
Teen decision making: no information included. | Dorsolateral prefrontal cortex; parietal lobe; planning and goal setting; assessing risks. |

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**Week 3 Reading:**
http://digitalcommons.chapman.edu/esi_working_papers/180/

| 5    | Randomness in decision-making. | Intuitive vs. rational decision making 
Mirror neurons and trust — empathetic vs systematic thinking in decision making. | Assigning values; attitudes about risk; trust your ‘gut’; attitudes about risk and trust. 
Oxytocin. |

The neuroscience research data are showing that there is a clear and consistent mapping between neural activity and behavior. By understanding this relationship, the students able to look at the implicit bias test and false memories to evaluate their role in biased and racist behaviors in healthcare and the courtroom.

**Week 5 Readings:**
Test yourself—Do you have implicit biases?  https://implicit.harvard.edu/implicit/


Loftus, E. TED TALK: *The Fiction of Memory* 
https://www.ted.com/talks/elizabeth_loftus_the_fiction_of_memory

| 6    | Learning Strategies | Which has the higher yield: 
Trial and error or 
Anticipate and Respond? | Reinforced vs belief based learning. 
Consumers reveal what they really think. |

COGS2 aims to raise the awareness of how technology can be used to mitigate implicit biases and racist tendencies. We aim to facilitate the student’s progression from being unaware of implicit bias to action in mitigating the bias. Towards this end, we look at how technology can be used in this educational endeavor.

**Week 6 Readings:**


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| 7    | Emotional decisions | Bubbles and Tanks: How fear and greed drive financial markets.  
The EBay brain effect — Blame your fear of losing for auction overbidding. | Amygdala; striatum |

In this section, we explore the fears and emotional underpinnings of decision-making. The implicit biases which are deeply embedded within our minds are at the heart of the inequity of associated with the disparity of students of color being treated more harshly in the educational system — school punishments, suspensions, juvenile justice system.

Here we also explore the nature of cognitive embodiment as virtual reality tools are used as an intervention for changing implicit racial bias.

_Caught_ is a podcast produced by WNYC studios looking at the effects of mass incarceration of the juvenile population. Almost 50% of all cases in juvenile court are comprised by African American youth. There is a significant racial disparity in the population demographics of those incarcerated. African Americans are incarcerated at five times the rate of the white population.

**Week 7 Readings:**
- **Caught**: Brain science convinced the Supreme Court to give thousands of so-called "juvenile lifers" a shot at freedom.

| 8    | The NEW market researchers. | The best Super Bowl ads? Your brain knows first.  
Marketing researchers are getting into your head, literally. | EEG, fMRI and MEG |

In this section we will look at the various aspects that underly political beliefs. We will explore how identity, cognitive embodiment and brain structure may drive partisan identities.

We discuss how one’s personal valuation of money may underly the one’s support for government policy on money to maintain the _status quo_ of inequality and marginalization.

**Week 8 Readings:**
- Alexander G. Theodoridis (2017), Me, Myself, and (I), (D), or (R)? Partisanship and Political Cognition through the Lens of Implicit Identity, *The Journal of Politics*, (79) 4.
A look at the government’s secret power to control almost everything around you.  
https://www.wnycstudios.org/story/radiolab-presents-more-perfect-one-nation-under-money
### Week 9 Readings (for individual papers and group presentions):

- Jooa Julia Lee and Francesca Gino (2015), Poker-faced morality: Concealing emotions leads to utilitarian decision making, *Organizational Behavior and Human Decision Processes 126:49–64*
- Drummond and Fischhoff (2017) Individuals with greater science literacy and education have more polarized beliefs on controversial science topics. *PNAS, vol. 114 (36).*

### Week 10 Readings:

- Jooa Julia Lee and Francesca Gino (2015), Poker-faced morality: Concealing emotions leads to utilitarian decision making, *Organizational Behavior and Human Decision Processes 126:49–64*
- Drummond and Fischhoff (2017) Individuals with greater science literacy and education have more polarized beliefs on controversial science topics. *PNAS, vol. 114 (36).*