

Neuroscience & Society

University of Pennsylvania, PSYC2288

Fall 2023: Tuesday & Thursday, 10:15-11:45 (Levin 111)

This is a course about the role of neuroscience—and of neuroscientists—in society. Because you are beginning this course with some background in neuroscience already, you know that researchers have made tremendous progress toward understanding the neural bases of human behavior. As this progress continues, neuroscience becomes relevant to a wide range of human activities, including law, education, politics, and communication. In this course, we will examine the ways in which neuroscience is being applied in diverse sectors of society. For each sector, we will review the relevant neuroscience and then study the application of neuroscience to that sector in more detail. What has neuroscience brought to these endeavors that is new and helpful? Which applications of neuroscience represent genuine breakthroughs, and which are “neurohype”? How might these developments change society? What new ethical, legal and social challenges are raised by neuroscience? The assignments you complete for this course will challenge you to think not only about the application of neuroscience to society but also about the role that neuroscientists can play in engaging with the public.

Your teaching team

Sharon Thompson-Schill

Professor of Psychology

thompson@psych.upenn.edu

Office hour: Friday 2-3 (or by appt)

Richards Labs, Room D405

Drop-in “open house” (like office hours, but different): time and location TBA each week

Kristin Murtha

Teaching Assistant

krmurtha@sas.upenn.edu

Office hour: Monday 1-2 (or by appt)

Levin 461

Learning objectives

1. You will expand your knowledge of the fundamentals of social, cognitive, and affective neuroscience, including classic and cutting-edge findings about the human mind and brain and the experimental methodologies that were used to discover them.
2. You will apply your expertise in neuroscience to understand and evaluate how and why neuroscience is applied to various sectors of society (for better or worse), and you will understand the issues one should consider when attempting to translate neuroscience findings into the “real world.”
3. You will practice the craft of conveying scientific findings to audiences with different levels of expertise and background in science; and you will learn about the important role that scientists play in enhancing public understanding of the neural basis of human behavior.

Note. All students must have completed one of the following biological psychology courses before enrolling in this course: PSYC1210 (Introduction to Brain & Behavior), PSYC1230 (Cognitive Neuroscience), PSYC1530 (Memory), or PSYC2555 (Neuroeconomics)

What is in this syllabus?

This syllabus has two important functions: Firstly, we have tried to set expectations and define your responsibilities in this course. Our goal is for you to succeed, and we have tried to outline what you will need to do to make that happen. Much of that guidance is herein; more will be provided in person and via Canvas. Please think of this document as your primary source of information about the policies for the course. If it is in the syllabus, you are responsible for it. Since you are reading this sentence, you are already off to a good start on learning about the course! Secondly, this syllabus contains a preview of topics that we will be discussing in class. Unlike other syllabuses you have probably seen, we have not listed all of the readings and assignments with each topic; more on that below, and yes, “syllabuses” is the plural of “syllabus.” (You are already learning something in this class!) Keep in mind that the course schedule on this syllabus is provisional and subject to change. The most up-to-date version of the course schedule is on the course site on Canvas. Note. The due dates for major assignments will not change.

Learning assessments

We have grouped the various assessment tools that we will use in this course into three categories, which vary not only in their objectives (described below) but also in the extent of time and effort we expect the assessment to require (from least to most). More information about each will be posted on Canvas, including our expectations and grading rubrics. This is a brief overview to the plan:

1. **Understanding neuroscience and society:** The “daily work” of this course is designed to help you learn and actively engage with the material we are discussing; participating fully in this course requires a combination of attendance; active engagement during class; preparation for class by reading/viewing assigned materials and completing homework assignments; and, contributing to group activities during class. Collectively, we will refer to the assessment of this collection of activities as your “participation grade.” Every week, you should expect to submit several short assignments, both at home and during class. The goal of these assignments is to help you assess whether you are understanding the course material and achieving your goals for this class.

The homework assignments will typically ask you to reflect on the materials you have read/heard/viewed for that week, and to pose a question to one of the authors/speakers based on the full set of materials; full credit will be awarded for questions that integrate and synthesize material across the various assigned materials. On rare occasions where the grading is more complicated, the grading rubric will be explained with the assignment. You will find descriptions of these assignments (what to submit, when to submit it, how many points it is worth) in the module for each week (see the late submission policy at the end of this section). You will also find instructions about whether the homework assignment should be completed alone or whether collaboration with peers is allowed. In general, you should expect to submit a homework assignment one day before the class in which those materials will be discussed. (On weeks with only guest lectures, there will be a homework assignment that is explained in the relevant module.)

In-class group work will take a variety of forms, and will generally require students to access a shared Google Doc from your laptop, tablet, or cell phone. You can expect to work on one group activity in each class during which we do *not* have a guest speaker (class sessions with group activities are denoted with an asterisk on the Course Schedule). If you are absent from one of these classes, there is no opportunity to make up group work from the missed class, but as explained below, everyone can miss two weeks without penalty.

There are 12 weeks during which you can accrue points towards your participation grade, beginning with Week 2, and ending at Thanksgiving break; each week there will be 10 points you can earn through a combination of attendance, in class group work, and homework. For example, for a week with one guest speaker, the score for that week might be based on attendance at the guest lecture (2 points), attendance and participation in a group activity in the other class (4 points), and one homework assignment (4 points). Your score (out of 100) will be based on your 10 best weeks. If you have to miss class for religious observances, athletic events, job interviews, or just a mental health day, that will be one of your two dropped weeks. We will also provide some make-up options (i.e., “bonus points”) throughout the semester so everyone has the option to replace some missing (or unsuccessful) work. Keep an eye out for these opportunities on the announcements on our course Canvas page (e.g., posting your Introduce Myself video for 4 pts).

Your percentage of total points—based on daily attendance, homework assignments, and in-class group activities—for your ten best weeks (out of 100 points) plus any additional bonus points, will contribute 30% to your final grade for the course.

2. **Experiencing neuroscience in society:** There are many ways for you to learn about neuroscience and society outside of the classroom, and there are many opportunities that will reinforce, complement, or expand the ideas we discuss in class. You will be required to arrange at least two such experiences, and to submit a short report that describes what you have learned, in a style that is written for a scientifically literate but non-expert audience (e.g., another Psychology major). Examples include: Participating in a neuroscience experiment, interviewing a scientist, attending a talk, volunteering in a neuroscience related activity at a local school, etc. We will share suggested activities periodically (e.g., the three talks listed at the end of the syllabus), but you can also seek our pre-approval for activities you discover before we do. Your Experience Report should reflect what you have learned from this experience as well as relevant information from at least one scholarly paper (max 1000 words, which is approximately two pages of this section of the Syllabus).

Because neuroscience is almost entirely done in collaboration with peers, we have designed this assessment to be done collaboratively; however, if you need or choose to work alone, we have an option for you too. You will form a group of up to four people for this assessment early in the semester (or declare your decision to work alone). The entire group must participate in each experience. For each assignment, one member of the group will be the “lead author” of the report (and each group member will play that role once); the other members of the group are expected to participate in the experience, to discuss the report with the lead author, and to provide comments on a draft. All members of the group will submit the (same) report on Canvas. The grade

for this assessment will reflect all group reports, with 70% of your grade based on the report for which you were lead author and 30% of your grade based on the average of the other reports for your group. If you elect to do this assessment alone, you are required to participate in two experiences and submit two reports (as solo author); your highest score will contribute 70% to your grade and your lowest score will contribute 30%. **The total score for this assessment will contribute 40% to your final grade for the course.**

- 3. Communicating neuroscience to society:** An important theme of this course is understanding how neuroscience research is communicated to society (and the role of neuroscientists in that enterprise), and your final project for this course will help you hone your skills in doing just that. Throughout the semester, you will be exposed to a variety of media that communicate neuroscience to public audiences through spoken and written formats; you will adopt one of these media formats for your final project. As with the above assessment, you will have options for group or individual work. You will pick a specific example of the influence of neuroscience in society, and you will learn about this topic through a combination of scholarly readings and expert interviews. **You will submit a preliminary proposal midway through the course (worth 15% of the grade for this project), and then you will deliver your final project during the last two weeks of classes.** The three options are (i) a podcast featuring several interviews, narration, and other audio material, produced by a group of four students; (ii) a TED talk describing the topic to a general audience; (iii) a magazine article for a venue like Scientific American, Discover, and the like. During our last two weeks of class, we will listen to the podcasts and TED Talks, and we will have a brief interview with each of the article authors. For all options, you will also submit a one paragraph summary of your project that lists the names of the people you interviewed and the citations for the scholarly articles (or any other materials) that you read. If you elect the group podcast option, each group member should submit their own proposal and summary, and both should describe what each individual plans to (and then does) contribute to the project. **Your grade will be based on your written proposal and your final project, as well as attendance and homework assignments in the final four classes; the total score will contribute 30% to your final grade for the course.**

Late submission policy: Assignments submitted by the announced deadline will be eligible for full credit. Assignments submitted within 48 hours of the announced deadline will be eligible for, at most, 80% credit. Assignments will not be accepted beyond that point. If you have elected a group option, all group members share responsibility for submitting work on time.

Homework assignments that contribute to your participation grade will typically be due at 10 am the day before the class period in which that work will be discussed. In recognition of the fact that life happens, you may submit weekly homework assignments late up to **two times** without penalty. To ensure fairness to everyone, however, there are otherwise no extensions. Please plan ahead! If you find yourself in a tight spot and really need more time, turn in the assignment late, take the penalty, and try to avoid similar situations in the future.

Course materials

You will find information and materials that you need to succeed in this class on the course site on Canvas, including this syllabus. When you navigate to the Modules tab, you will see a module for each week. Each module will include information for you to consume (i.e., readings, podcasts, videos) and assignments for you to submit. Materials and homework assignments will generally be available in the relevant module at least one week prior to class. For each new section of the class (e.g., Neuroscience in the Courtroom), you will find an Overview document that explains the plan for the upcoming week; read this first and be alert for any updates. You are expected to do the readings and view any media, as assigned on Canvas under the Modules tab, prior to coming to class. Class time will be a mix of lecture and engagement with the assigned materials, and it will be difficult to fully participate without having prepared.

Communication and email policies

If you have a question about the course, your first resource should be the course site on Canvas. We will strive to pre-emptively address questions that will come up in relevant places on the site. Your second course of action should be to come to talk to the instructor or the teaching assistant. We are often available in (or just outside) the classroom right before or right after class for quick questions. You might be tempted to email one of us, thinking that will be the fastest way to get your question answered, but this is not likely to be true. And, many issues are much better dealt with in person. If you are having any problems with the course, it is important to see one of us as soon as possible so we can work together to address the situation. **If you do decide to email one of us, please make sure to put the course number (2288) in the subject line of your message.** You can expect a reply between 24 - 72 hours after you send your message. But, if your email implies a long reply, please come to office hours (or, if the issue is not personal, come to an Open House hour).

Academic integrity and student accommodations

Intellectual development requires honesty, responsibility, and doing your own work. Taking ideas or words from others — plagiarizing — is dishonest and will result in a failing grade on any compromised assignment and possibly other disciplinary actions. Students are expected to be familiar with and comply with Penn's Code of Academic Integrity, which is available online at <https://catalog.upenn.edu/pennbook/code-of-academic-integrity/>. If you have any doubts or questions about what constitutes academic misconduct, please do not hesitate to contact us.

Any students with documented academic accommodations should discuss them with us by the second week of class and register with the Office of Learning Resources at the Weingarten Center (www.vpul.upenn.edu/lrc). In a crisis situation, you are encouraged to contact CaseNet for support (col-casenet@groups.sas.upenn.edu) in addition to informing us.

Wheelchair Accessible and Gender Neutral restrooms are found downstairs in the corridor between Levin & Leidy (L16 & L17) – take the elevator down to avoid the stairs if necessary.

Classroom activities, expectations & policies

Overview: This class will be different from some other lecture-based courses you may have taken in the past. This course is taught in a format that mixes lectures, discussions, and activities. This type of course organization is sometimes known as "Structured Active In-Class Learning (SAIL)." Students in a SAIL classroom can expect frequent feedback. In the classroom, this feedback is often instantaneous and informal and comes from your peers and from the professor and LA. It is always allowed and encouraged to share your questions with others and to adapt and update your own ideas and answers in response. The center of activity in the classroom will usually be at your table with other members of your assigned group. It is important for students in classroom to value not just their own success but the success of others as well. Success in SAIL format classes requires developing comfort with the uncertainty and struggle that come with learning in a very public environment. You must always be supportive and encouraging of others and have the right to expect others to support and encourage you. SAIL courses are not for everyone, and you should not feel bad (nor will we be offended) if you decide that you would prefer a different learning environment. If you choose to take the course, we expect you to be committed to the goals, expectations, and opportunities of a SAIL course.

Group work: Our classroom is furnished with tables for small groups, instead of rows of chairs, to facilitate the SAIL experience. Many class meetings will feature small group discussions or activities around the work tables. We all know that the seat that a student chooses on the first day of class typically becomes their home base for the entire semester. We are going to do things a little differently, to facilitate opportunities to interact with different groups of students in each class meeting. When you arrive at class each day, you will draw a playing card from a deck that will indicate at which numbered table you should sit that day (ace = 1). There will usually be an "icebreaker" prompt to discuss as your classmates arrive at your table. If you arrive after 10:15, please enter through the rear door where you can find the deck of cards.

All students are expected to participate fully and listen to, and respect, everyone else in their group and in the class. Please remember that groups are only effective if everyone treats each other with respect. You are encouraged to communicate your thoughts, but please also allow others in your group to also express their thoughts. You will be surprised how much you can learn by mutual respect of each other's ideas, even if you are knowledgeable about a subject. Try to be receptive to constructive criticism, and open about accepting mistakes. Please come to the class prepared and take ownership of your group's success.

Attendance: In order to succeed in this course, you will need to attend class. A large percentage of your grade is based on classroom activities and discussions, and these activities cannot be made up if you miss class. If you have to miss class for an extended period of time, due to a COVID-related quarantine or due to other extenuating circumstances (usually involving CaseNet or the involvement of a dean, see above), we can discuss alternative arrangements for you. Other than these sorts of long-term absences from all courses, we will be requiring attendance to receive a full participation grade. You may miss up to two sessions for any reason—illness, religious observance, sporting events—with

no penalty. Additional absences will affect your participation grade. [Please inform us of all absences using the Course Absence Report system.](#)

Note taking & technology: Laptops and tablets are welcome in class and will often be used in group work, so please feel free to bring them (as long as your volume is silenced), but be mindful of their use and please only use them for note taking and for classroom activities as directed. More broadly, be considerate: it is distracting for your fellow students if you are accessing e-mail or online in class. Research has found that laptop use impaired academic performance not only for students using a laptop, but also for students within view of a laptop screen even if they themselves were not using a laptop. Cell phones must be on silent and stowed away during class unless permission is given for their use in a specific activity. *Frequent non-course use of phones, laptops, or tablets will negatively impact your participation grade.*

Inclusivity & community membership: It is our intent that students from diverse backgrounds and perspectives are served well by this course and that our diversity as a class be viewed as a resource and benefit for our learning purposes. This can only happen if all members of the course community – the instructor, teaching assistant, and students – work together to create a supportive, inclusive environment that welcomes all students, regardless of their race, ethnicity, gender identity, sexuality, religious beliefs, physical or mental health status, or socioeconomic status. Diversity, inclusion, and belonging are all core values of this course. All participants in this course deserve to and should expect to be treated with respect by other members of the community. Some of the material we consider in class will be sensitive and challenging to discuss. It is imperative that there be an atmosphere of respect and safety in our classroom, and we expect that all students work towards this goal with an open mind, especially when discussing controversial subjects. Lectures, office hours, and group working time should be spaces where everyone feels welcome and safe. *If there is a situation inside the classroom or out that impacts your course performance or your work with other students, please let us know.*

Our community agreements: In order to create a welcoming environment, to cultivate a sense of belonging among students, and to facilitate students' ability to engage productively with one another across their differences, students of this course agree to:

[This will be completed in our first session.]

Course Schedule (may be updated throughout the semester)

* Class sessions marked with an asterisk will include a graded group activity

Aug 29 Introduction to the course
Aug 31 Neuroscience refresher Part 1

Sept 5 Neuroscience refresher Part 2: Spotlight on brain imaging *
Sept 7 Neuroscience in the courtroom: Free will *

Neuroscience in the Courtroom

Sept 12 The criminal brain (Guest: Adrian Raine)
Sept 14 Perils and promises of neuroscience for law (Guest: Stephen Morse)
Note. There will be a homework assignment this week due on Sept 15

Sept 19 Neuroscience in the courtroom: Moral reasoning *
Sept 21 What does neuroscience do for law? (Guest: Martha Farah)

Sept 26 Brain imaging in the courtroom (Guest: Geoff Aguirre)

Neuroscience in the Clinic

Sept 28 Neuroscience in the clinic: Meditation and the brain *
(Meditation practice with Gary Schapiro)

Oct 3 Neuroscience and trauma (Guest: Vishnu "Deepu" Murty)
Oct 5 Neuroscience in the clinic: Drugs of use (cognitive enhancement) & abuse (addiction) *

Oct 10 Psychadelics and brain health (Guest: Victor Pablo Acero)
Oct 12 - Fall Break -
Note. There will be a homework assignment this week due on Oct 11

Neuroscience in the Community

Oct 17 The making of a science podcast (Guest: WHYY's Liz Tung) *
Oct 19 Neuroaesthetics (Guest: Anjan Chatterjee)

Oct 24 How ideas spread (Guest: Emily Falk)
Oct 26 Neurotechnology in the workplace (Guest: Michael Platt)
Note. There will be a homework assignment this week due on Oct 25

Oct 31	Neuroscience in the community: Race and sexuality *
Nov 2	Brain stimulation for cognitive enhancement (Guest: Roy Hamilton)
Nov 7	Neuroscience in the community: (open for suggestions) *
Nov 9	Neuroscience and the military (Guest: Jonathan Moreno)

Neuroscience in the Classroom

Nov 14	Neuroscience in the classroom: The adolescent brain *
Nov 16	Brain development and plasticity: Implications for education (Guest: Monica Ellwood-Lowe)
Nov 21	Socioeconomic inequality and children's brain development (Guest: Kimberly Noble) <i>This class may be attended remotely</i>
Nov 23	- Thanksgiving Break - <i>Note. There will be a homework assignment this week due on Nov 22</i>
Nov 29	Project Presentations
Nov 30	Project Presentations
Dec 5	Project Presentations
Dec 7	Project Presentations

Other dates to know:

Major assignment due dates

Sep 29	Submit group information for Experience Reports by 10 am
Oct 11	Submit first Experience Report(s) by 10 am
Oct 27	Submit project proposal by 10 am
Nov 28	Submit final project by 10 am <i>Note. We will listen to podcasts and TED talks during the final four classes but regardless of the assigned presentation date, all projects are due on this date.</i>
Dec 11	Submit second Experience Report(s) by 10am <i>Note. If you are in a group of more than two people, you will have more than two reports; half are due Oct 11 and half, plus one for odd numbers, are due Dec 11.</i>