

# SCAN Foundations

PSYCH 511.003 Spring 2025

2024-12-13



Figure 1: Source: <https://www.brainfacts.org/neuroscience-in-society/law-economics-and-ethics/2019/neuroethics-asks-the-difficult-questions-031319>

## Instructor

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+1 (814) 865-3664 rog1 AT-SYMBOL psu PERIOD edu [Schedule an appointment](#) Lab site: <https://gilmore-lab.github.io> Personal site: <https://rick-gilmore.com>

## Meeting Location and Time

467 Moore Thursdays, 1-3 PM.

## About the course

The first scientific psychologists were physiologists fascinated by the possibility of understanding the mind by studying the brain. In this course, we will explore the historical roots and contemporary challenges associated with the study of biological approaches to complex adaptive behavior. In doing so, we will read and examine critically primary source readings that discuss basic patterns and processes of brain structure and function. The goal is to provide students with a basic foundation of knowledge about the structures and functions of the nervous system that can provide the basis for future study.

This course is one of two required courses for the [Specialization in Cognitive and Affective Neuroscience \(SCAN\)](#).

## Prerequisites

Undergraduate coursework in neuroscience or physiological psychology such as the equivalents of PSYCH 260 or BIO 469/470.

## January 13-17

### Thursday, January 16

#### Topics

- Structure of the course
- Levels of analysis
- Causality in brain and behavior
- Does neuroscience need behavior? If so, what does psychology need?

#### Readings

- (Siddiqi et al. 2022).
- (Krakauer et al. 2017).
- Optional: (Parada and Rossi 2018)chrome.
- Optional: (Churchland and Sejnowski 1988).
- Optional: (Favela 2020).

#### Materials

- [Slides](#)
- [Exercise 01](#) assigned



**January 20-24**

**Thursday, January 23**

**January 27-31**

**Thursday, January 30**

**February 3-7**

**Thursday, February 06**

**February 10-14**

**Thursday, February 13**

**February 17-21**

**Thursday, February 20**

**February 24-28**

**Thursday, February 27**

**March 3-7**

**Thursday, March 06**

**March 10-14 *Spring Break***

**March 17-21**

**Thursday, March 20**

**March 24-28**

**Thursday, March 27**

**March 31 - April 4**

**Thursday, April 03**

**April 7-11**

**Thursday, April 10**

**April 14-18**

**Thursday, April 17**

**April 21-25**

## References

- Churchland, P S, and T J Sejnowski. 1988. "Perspectives on Cognitive Neuroscience." *Science* 242 (4879): 741–45. <https://www.ncbi.nlm.nih.gov/pubmed/3055294>.
- Favela, Luis H. 2020. "Cognitive Science as Complexity Science." *Wiley Interdisciplinary Reviews. Cognitive Science* 11 (4): e1525. <https://doi.org/10.1002/wcs.1525>.
- Krakauer, John W, Asif A Ghazanfar, Alex Gomez-Marin, Malcolm A MacIver, and David Poeppel. 2017. "Neuroscience Needs Behavior: Correcting a Reductionist Bias." *Neuron* 93 (3): 480–90. <https://doi.org/10.1016/j.neuron.2016.12.041>.
- Parada, Francisco J, and Alejandra Rossi. 2018. "If Neuroscience Needs Behavior, What Does Psychology Need?" *Frontiers in Psychology* 9 (March): 433. <https://doi.org/10.3389/fpsyg.2018.00433>.
- Siddiqi, Shan H, Konrad P Kording, Josef Parvizi, and Michael D Fox. 2022. "Causal Mapping of Human Brain Function." *Nature Reviews. Neuroscience* 23 (6): 361–75. <https://doi.org/10.1038/s41583-022-00583-8>.