

# BGGN 252 BIPN 147 - Computational Systems Neurobio - Sejnowski [SP24]

UC San Diego – Spring 2024

April 2, 2024

MTW 4:00 – 4:50 pm PODEM 1A18

Terrence Sejnowski

## **BIPN 147: Computational Systems Neurobiology Syllabus**

*Textbook: The Computational Brain*, P. S. Churchland and T. J. Sejnowski, 2<sup>nd</sup> edition, MIT Press (2017)

*Hybrid Lectures:* Two in-person lectures (M,W) and one Zoom session (F) each week

*Course Zoom Sessions:* Fridays, 4:00 – 4:50 pm

<https://ucsd.zoom.us/j/6197421371>

Meeting ID: 619 742 1371

*Zoom Syllabus, Class Project and Videos:* <https://cnl.salk.edu/~terry/BIPN147-24/>

*Teaching Assistant:* Iulia Rusu [irusu@ucsd.edu](mailto:irusu@ucsd.edu) (<mailto:irusu@ucsd.edu>)

<https://ucsd.zoom.us/j/7120553662>

Meeting ID: 712 055 3662

*TA Sessions:* Thursdays 12:00 – 12:50 pm and 5:00 – 5:50 pm

## **Week 1 – Neural Coding and Decoding**

April 1	Rate coding	Chapter 2
April 3	Spike Coding	Chapter 3
April 5	Zoom Week #1	
	<b>Week 2 – Sensory Coding</b>	Chapter 3
April 8	Olfaction	Chapter 4
April 10	Retina	
April 12	Zoom Week #2	
	<b>Week 3 – Visual Cortex</b>	
April 15	Organization of Visual Cortex	Chapter 4
April 17	Orientation Tuning	Chapter 4
April 19	Zoom Week #3	
	<b>Week 4 – Visual Perception</b>	
April 22	Color, Motion, and Stereo	
April 24	Space and Gaze	Chapter 4
April 26	Zoom Week #4	Chapter 6

## **Week 5 – Visual Cognition**

April 29	Object Recognition	Chapter 4
May 1	Attention	Chapter 4
May 3	<i>Midterm Exam</i>	

## **Week 6 – Memory Systems**

May 6	Working Memory	Chapter 5
May 8	Long-term Memory	Chapter 5
May 10	Zoom Week #6	

## **Week 7 – Procedural Learning**

May 13	Reinforcement learning	Chapter 5
May 15	Temporal Difference Learning	Chapter 5
May 17	Zoom Week #7	

## **Week 8 – Action Systems**

May 20	Oculomotor system	Chapter 5
May 22	Motor Cortex	Chapter 6

May 24 Zoom Week #8

**Week 9 – Neuromodulation**

May 7 Central Pattern Generators

May 29 Sleep and Memory Consolidation Chapter 5

May 31 Zoom Week #9 Chapter 6

**Class Projects Due May 28**

**Week 10 – Large-Scale Cortical Activity**

June 3 EEG and MEG Appendix








June 5 Brain Imaging Appendix

June 7 Zoom Week #10

**Final Exam**

June 10-14

Course Summary:

Date	Details	Due
Thu Apr 4, 2024	 <a href="#">Week 1</a> ( <a href="https://canvas.ucsd.edu/courses/54346/assignments/793130">https://canvas.ucsd.edu/courses/54346/assignments/793130</a> )	due by 11:59pm
Mon Jun 3, 2024	 <a href="#">Midterm</a> ( <a href="https://canvas.ucsd.edu/courses/54346/assignments/793128">https://canvas.ucsd.edu/courses/54346/assignments/793128</a> )	due by 11:59pm
	 <a href="#">Final</a> ( <a href="https://canvas.ucsd.edu/courses/54346/assignments/793127">https://canvas.ucsd.edu/courses/54346/assignments/793127</a> )	
	 <a href="#">Project</a> ( <a href="https://canvas.ucsd.edu/courses/54346/assignments/793129">https://canvas.ucsd.edu/courses/54346/assignments/793129</a> )	
	 <a href="#">Week 2</a> ( <a href="https://canvas.ucsd.edu/courses/54346/assignments/793131">https://canvas.ucsd.edu/courses/54346/assignments/793131</a> )	
	 <a href="#">Week 3</a> ( <a href="https://canvas.ucsd.edu/courses/54346/assignments/793132">https://canvas.ucsd.edu/courses/54346/assignments/793132</a> )	
	 <a href="#">Week 4</a> ( <a href="https://canvas.ucsd.edu/courses/54346/assignments/793133">https://canvas.ucsd.edu/courses/54346/assignments/793133</a> )	