

## NGG 573: Neuroscience Core III 2023

### Course Directors:

Maria Geffen, Associate Professor of Otorhinolaryngology  
[mgeffen@pennmedicine.upenn.edu](mailto:mgeffen@pennmedicine.upenn.edu), <https://hosting.med.upenn.edu/hearing/>

Franz Weber, Assistant Professor of Neuroscience  
[weberf@pennmedicine.edu](mailto:weberf@pennmedicine.edu), <https://www.med.upenn.edu/weberlab/>

Bijan Pesaran, Professor of Neurosurgery  
[Bijan.Pesaran@Pennmedicine.upenn.edu](mailto:Bijan.Pesaran@Pennmedicine.upenn.edu), <https://pesaranlab.org/people/bijan-pesaran/>

### Teaching Assistant:

Adama Berndt, [berndtaj@pennmedicine.upenn.edu](mailto:berndtaj@pennmedicine.upenn.edu)

**Time:** MWF, 10:00am-12:00pm

**Location:** Lectures are in BRB 253. Anatomy labs meet in 210 Stemmler.

**Text :** *The Human Brain* (John Nolte [N]; any version) and *Principles of Neural Science* (Kandel & Schwartz [K&S]; 5th Edition). Copies of [K&S] are on reserve in the Biomedical Library, see "Course Materials@Penn Libraries" on the Canvas course page (only 3 persons can watch the book at a time). In addition K&S is available as pdf on the Canvas course page. Nolte is available through Penn Library's subscription to ClinicalKey; see also "Course Materials@Penn Libraries" on Canvas. Additional readings can be found in the "2023 Readings" folder on the Canvas website.

### Goals of Core III

- (1) Learn the basics of neuroanatomy through a targeted series of lectures and dissections.
- (2) Learn about the foundations of systems neuroscience.
- (3) Learn about the applications of systems neuroscience.

**Grading:** Homework (HW) assignments (90% total) and class participation (10%).

HWs will be distributed electronically via Canvas and will be returned electronically to the designated folder on Canvas. Each HW will contain 1 question provided by a lecturer from the previous week or that Monday. You should expect to spend about 2-3 hours to answer the question, including researching relevant information. HW will need to be returned on Canvas within 7 days.

<i>Day</i>	<i>Date</i>	<i>General Topic</i>	<i>Topic</i>	<i>Reading</i>	<i>Lecturer</i>	<i>Assignment</i>
W	Jan 11	Course overview		K&S 1, 2, 15	Maria Geffen and Franz Weber	
F	Jan 13	Anatomy	Anatomy/Lab 1		Yale Cohen and Eduard Lee	
M	Jan 16	<i>No class</i>				
W	Jan 18		Pathology		Eduard Lee	
F	Jan 20		Brainstem		Jay Gottfried	
M	Jan 23		Lab 2		Cohen and Lee	
W	Jan 25		Anatomy		Yale Cohen	

F	Jan 27		Lab 3		Cohen and Lee	
M	Jan 30		Lab 4		Yale Cohen	
W	Feb 1		Lab 5		Yale Cohen	
F	Feb 3		Practical		Yale Cohen	Practical
M	Feb 6	Development	Development 1	K&S 52-56	Jonathan Raper	
W	Feb 8		Development 2	K&S 52-56	Jonathan Raper	
F	Feb 10	Theory	Computational Neuroscience 1	K&S 21	Konrad Körding	
M	Feb 13		Computational Neuroscience 2	K&S 21	Vijay Balasubramanian	<b>HW 1</b>
W	Feb 15	Sensory-motor Systems	Vision 1	K&S 25-29	Michael Arcaro	
F	Feb 17		Vision 2	K&S 25-29	Ben Scholl	
M	Feb 20		Auditory System 1	K&S 30,31	Katherine Wood	<b>HW 2</b>
W	Feb 22		Vision 3		Nicole Rust	
F	Feb 24		Auditory System 2	K&S 30,31	Maria Geffen	
M	Feb 27		Auditory System 3	K&S 30,31	Michael Beauchamp	<b>HW 3</b>
W	Mar 1		Olfactory System 1	N18; K&S 25-29	Jay Gottfried	
F	Mar 3		Olfactory System 2	N18; K&S 25-29	Joel Mainland	
M	Mar 7	<i>Spring Break</i>				
W	Mar 9	<i>Spring Break</i>				
F	Mar 11	<i>Spring Break</i>				
M	Mar 13		Somatosensory System	K&S 22	Wenqing Luo	<b>HW 4</b>
W	Mar 15		Hunger		Amber Alhadeff	
F	Mar 17	Motor Systems	Eye Movements	K&S 38,39	Long Ding	
M	Mar 20		Striatum		Marc Fuccillo	<b>HW 5</b>
W	Mar 22		Spatial Navigation		Russell Epstein	
F	Mar 24		Motor System		Bijan Pesaran	
M	Mar 27	Hippocampus & Learning	Hippocampus, Plasticity, and TBI	K&S 55,56	Akiva Cohen	<b>HW 6</b>
W	Mar 29		Hippocampus & Learning	K&S 65	Kimberly Christian	
F	Mar 31		Hippocampus & Neurogenesis		Hongjun Song	

M	Apr 3	Amygdala	Fear and Amygdala	K&S 65,66	Steven Thomas	<b>HW 7</b>
W	Apr 5		Pain and Amygdala		Greg Corder	
F	Apr 7	Addiction	Dopamine and Addiction		Heath Schmidt	
M	Apr 10	Sleep & Circadian Rhythms	Circadian Rhythms	K&S 51	David Raizen	<b>HW 8</b>
W	Apr 12		Neural Circuits of Sleep	K&S 51	Franz Weber	
F	Apr 14		Sleep and Development		Matthew Kayser	
M	Apr 17		Sleep and Neuromodulation		Shinjae Chung	<b>HW 9</b>
W	Apr 19	Techniques & Applications	TMS / Lab tour		Roy Hamilton	
F	Apr 21		fMRI/TMS		Desmond Oathes	
M	Apr 24		Imaging Techniques		Tim Machado	<b>HW 10</b>
W	Apr 26		BMI		Flavia Vitale	