

NGG 573: Neuroscience Core III 2021

Course Directors: Maria Geffen, Franz Weber

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

Location: All lecture and labs are virtual. A link for the lecture will be sent to the students.

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). Nolte is available through Penn Library's subscription to ClinicalKey; see also "Course Materials@Penn Libraries" on Canvas. Additional readings are found in the "2020 Readings" folder on the Canvas website.

Goals of Core III

- (1) Learn the basics of neuroanatomy through a targeted series of lectures and dissections (Due to the pandemic, neuroanatomy courses are shortened, and there will be no graded practical on anatomy).
- (2) Learn about the foundations of systems neuroscience.
- (3) Learn about the applications of systems neuroscience.

Grading: Take-home quizzes (90% total) and class participation (10%).

Quizzes will be distributed electronically via Canvas and will be returned electronically to the designated folder on Canvas. Each quiz will contain 2 questions provided by the lecturers from the previous week or that Monday. Quizzes will need to be returned within **72 hours (96 hours** if the time window overlaps with a Day of Engagement).

| <i>Day</i> | <i>Date</i> | <i>General Topic</i> | <i>Topic</i> | <i>Lecturer</i> | <i>Quiz</i> |
|------------|-------------|-----------------------|--------------------------------------|-----------------|-------------|
| W | Jan 20 | Course overview | K&S 1, 2, 15 | Geffen/Weber | |
| F | Jan 22 | Anatomy | Lab 1 | Cohen | |
| M | Jan 25 | | Pathology | Lee | |
| W | Jan 27 | | Lab 2 | Cohen | |
| F | Jan 29 | | Lab 3 | Cohen and Lee | |
| M | Feb 1 | | Brainstem | Gottfried | |
| W | Feb 3 | Anatomy | Lab 4 | Cohen | |
| F | Feb 5 | Development | Basics: development; K&S 52-56 | Raper | |
| M | Feb 8 | | Basics: development; K&S 52-56 | Raper | Quiz 1 |
| W | Feb 10 | Theory | Computational Neuroscience 1; K&S 21 | Kording | |
| F | Feb 12 | Day of Engagement | | | |
| M | Feb 15 | Sensory-motor systems | Vision development; K&S 25-29 | Arcaro | Quiz 2 |
| W | Feb 17 | | Vision 1; K&S 25-29 | Scholl | |
| F | Feb 19 | | Vision 2; K&S 25-29 | Contreras | |
| M | Feb 22 | | Auditory system 1; K&S 30-31 | Eliades | Quiz 3 |
| W | Feb 24 | | Vision 3 | Epstein | |
| F | Feb 26 | | Auditory system 2; K&S 30-31 | Geffen | |

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|---|--------|-----------------------------|---|-----------------|---------|
| M | Mar 1 | | Olfactory and gustatory systems 1; K&S 32 | Gottfried | Quiz 4 |
| W | Mar 3 | | Taste; N18; K&S 25-29 | Mainland | |
| F | Mar 5 | Hunger | | Alhadeff | |
| M | Mar 8 | Spring Break | | | |
| W | Mar 10 | Spring Break | | | |
| F | Mar 12 | Spring Break | | | |
| M | Mar 15 | | Somatosensory system; K&S 22 | Luo | Quiz 5 |
| W | Mar 17 | Learning & Memory | Hippocampus & Neurogenesis | Song | |
| F | Mar 19 | | Eye movements; K&S 38-39 | Ding | |
| M | Mar 22 | | Striatum | Fuccillo | Quiz 6 |
| W | Mar 24 | | Hippocampus & Learning; K&S 65 | Christian | |
| F | Mar 26 | | Hippocampus & Plasticity; K&S 55,56 | Cohen | |
| M | Mar 29 | | Fear and the amygdala; K&S 65 | Thomas | Quiz 7 |
| W | Mar 31 | | Theory of memory | Kahana | |
| F | Apr 2 | Sleep and Circadian Rhythms | Sleep & Neural circuits; K&S 51 | Weber | |
| M | Apr 5 | | Sleep & Neuromodulation | Chung | Quiz 8 |
| W | Apr 7 | | Circadian Rhythms; K&S 51 | Raizen | |
| F | Apr 9 | | Sleep & Development | Kayser | |
| M | Apr 12 | Day of Engagement | | | Quiz 9 |
| W | Apr 14 | Psychiatric Disorders | Dopamine & Addiction | Dani | |
| F | Apr 16 | | Autism | Zhaolan | |
| M | Apr 19 | | Neuroepigenetics & Depression | Heller | Quiz 10 |
| W | Apr 21 | Techniques & Applications | BMI | Vitale | |
| F | Apr 23 | | 2p imaging | Orthmann-Murphy | |
| M | Apr 26 | | TMS | Hamilton | Quiz 11 |
| W | Apr 28 | | DBS | Lucas | |