NEUROSCIENCE (NEURODPT)

NEURODPT/NTP 610 – CELLULAR AND MOLECULAR NEUROSCIENCE
4 credits.

Study of original papers leading to an understanding of the molecular basis of electrical activity in neurons. Topics include voltage-sensitive currents, molecular biology of neuronal receptorrs, synaptic transmission and sensory transduction.
Requisites: ZOOLOGY/PSYCH 523 and (PHYSICS 202, 208, or 248), or graduate/professional standing
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023

NEURODPT/NTP/PSYCH 611 – SYSTEMS NEUROSCIENCE
4 credits.

Introduction to the anatomy and physiology of the mammalian nervous system. Lectures will cover the neuroanatomy of the major subdivisions of the human brain, the major sensory and motor systems, and higher order functions. Lab/discussion sections will emphasize readings from the primary literature and hands-on dissections.
Requisites: NEURODPT/NTP 610 or graduate/professional standing
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024

NEURODPT/ZOOLOGY 616 – LAB COURSE IN NEUROBIOLOGY AND BEHAVIOR
4 credits.

Independent experimental modules exploring neurophysiology and behavior will be completed in groups. Learn techniques and develop investigations into three separate areas of neurobiology.
Requisites: ZOOLOGY/PSYCH 523 and PSYCH 454
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2017

NEURODPT/NTP 629 – MOLECULAR AND CELLULAR MECHANISMS OF MEMORY
3 credits.

Focuses on the cell signaling and the resulting structural changes that occur at neuronal synapses during memory formation. The aim is to understand how the synaptic changes underlying memory occur.
Requisites: Graduate/professional standing or ANAT&PHY 335, 435, PHYSIOL 335, 435 or ZOOLOGY/PSYCH 523
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2023

NEURODPT/NTP 640 – COMPUTATIONAL NEUROSCIENCE: FROM SINGLE CELLS TO WHOLE BRAIN MODELS
3 credits.

Theory and application of methods in computational neuroscience across various levels of organization from single cells to global brain dynamics and cognition. Computational neuroscience is an approach to understanding the development and function of nervous systems in mechanistic terms at many different structural scales. Topics include biophysical properties of neurons and synapses, neural plasticity, sensory systems, neural circuits, whole brain analysis and modeling, and different views on brain function. Includes primers on relevant computational techniques (ICA, information theoretical approaches, dynamical systems) and a computational problem set. Starts with an introduction to MATLAB (used for problem sets).
Requisites: PSYCH/ZOOLOGY 523, PSYCH 454, MATH 221, and (PHYSICS 104, 202, 208, or 248); or graduate/professional standing and NEURODPT/NTP 610 and PSYCH/NEURODPT/NTP 611
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024

NEURODPT/PSYCH/ZOOLOGY 674 – BEHAVIORAL NEUROENDOCRINOLOGY SEMINAR
2 credits.

Behavior results from a complex interplay among hormones, the brain, and environmental factors. Behaviors and their underlying neural substrates have evolved in response to specific environmental conditions, resulting in vast species diversity in behavioral and neuroendocrine solutions to environmental problems. Designed to explore the primary literature on the neuroendocrine underpinnings of behavior spanning from feeding to sex differences in complex social behaviors. A range of taxonomic groups will be discussed, including (but not limited to) mammals, birds, and fish.
Requisites: ZOOLOGY/BIOLOGY 101, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 383 or graduate/professional standing
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2021

NEURODPT 675 – SELECTED TOPICS IN PHYSIOLOGY
1-3 credits.

Topics include: advanced cardiovascular physiology, advanced respiratory physiology, advanced endocrinology, membrane transport physiology and neurobiology.
Requisites: None
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2019

NEURODPT 699 – DIRECTED STUDY
1-4 credits.

Independent work.
Requisites: Consent of instructor
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2024

NEURODPT 747 – SENSORY AND MOTOR SYSTEMS
2 credits.

Overview of the basic science principles of sensory and motor systems in the central and peripheral nervous system, with clinicians providing complementary presentations on their relevant experiences in the clinic. Topics include Somatosensory pathways in spinal cord, brainstem and cerebrum, Motor neurons in spinal cord and brainstem and the descending systems that control them, Blood Supply of the CNS and affiliated vascular syndromes, Cerebellum, Basal Ganglia and associated pathways, Eye Movement control, Vestibular, Auditory, and Visual systems and organization of Cerebral Cortex.
Requisites: MED SC-M 810, 811, 812, and 813
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2024

NEURODPT/NTP/ZOOLOGY 765 – DEVELOPMENTAL NEUROSCIENCE
3 credits.

Analysis of neural development with emphasis on experimental approaches. Combination of lectures and discussions of primary literature. Topics include neural induction, patterning, mechanisms of axon guidance, neural crest cell migration and differentiation, cortical development, and synapse formation and elimination.
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2023

NEURODPT 990 – RESEARCH AND THESIS
1-9 credits.

Research supervised by individual faculty members.
Requisites: Consent of instructor
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2024