Neuroscience

Chair
- Daniel T. T. (Neurology/Psychological and Brain Sciences)

Graduate degree: Ph.D. in neuroscience

Faculty: https://neuroscience.grad.uiowa.edu/faculty/
directory

Website: https://neuroscience.grad.uiowa.edu

The Neuroscience Program provides an interdisciplinary
and interdepartmental approach to graduate education and
research training in the structure, function, and development
of the nervous system and its role in cognition and behavior.

Students obtain training at all levels of the nervous system,
from cellular/molecular to the behavioral/cognitive.

Programs

Graduate Program of Study

Major
- Doctor of Philosophy in Neuroscience

Facilities

Training is conducted primarily in the laboratories and
teaching facilities of the Carver College of Medicine graduate
Departments of Anatomy and Cell Biology, Biochemistry,
Internal Medicine, Molecular Physiology and Biophysics,
Neurology, Pharmacology, and Psychiatry; and the College
of Liberal Arts and Sciences Departments of Biology,
Communication Sciences and Disorders, Health and
Human Physiology, and Psychological and Brain Sciences.

Students use faculty laboratories and central research
facilities for ultrastructural analysis; histochemistry and
immunocytochemistry; electrophysiology; fluorescence-
activated cell sorting; cellular and subcellular biochemistry;
cell, tissue, and organ culture; operant and classical
conditioning; molecular biology; behavioral genetics; neural
substrates of complex behavior; brain-behavior relationships
in humans; neuropsychology; and functional neuroimaging
(PET, fMRI).

Courses

Neuroscience Courses

NSCI:4353 Neurophysiology: Cells and Systems 3-4 s.h.
Physiological properties of nerve cells, nervous systems;
axonal conduction, synaptic transmission, sensory
transduction, integrative processes, higher functions.
Prerequisites: (BIOL:2753 or BIOL:3253) and (MATH:1460 or
MATH:1380 or MATH:1550 or MATH:1850) and ((PHYS:1511
and PHYS:1512) or (PHYS:1611 and PHYS:1612)). Same as
BIOL:4353.

NSCI:4753 Developmental Neurobiology 3 s.h.
Neural induction and nervous system patterning;
neurogenesis, axon and dendrite outgrowth and targeting;
synapse formation, specificity, refinement; mechanisms
of neuronal cell death; myelination; neural stem cells;
introduction to cellular, molecular, and genetic techniques in
studies of neural development. Prerequisites: BIOL:2753 with
a minimum grade of C- or BIOL:3253 with a minimum grade
of C-. Corequisites: BIOL:3253, if not taken as a prerequisite.
Same as BIOL:4753, MPB:4753.

NSCI:5161 Undergraduate Research in Neuroscience
err. Experimental research under faculty supervision.

NSCI:5210 Fundamentals of Behavioral Neuroscience 3-4 s.h.
Concepts, methods, and findings in behavioral and cognitive
neurosciences: emphasis on principles of neuroscience,
sensation, motivation, emotion. Same as PSY:5210.

NSCI:5212 Foundations in Behavioral and Cognitive Neuroscience 4 s.h.
Concepts, methods, and findings in behavioral and cognitive
neurosciences. Prerequisites: BIOL:3253 or PSY:5210 or
NSCI:5210. Same as PSY:522.

NSCI:5365 Seminar: Neuropsychology and Neuroscience arr.
Clinical neuropsychology and cognitive neuroscience: cutting-
edge research from scientific journals, case presentations
in clinical neuropsychology, and current research. Same as
NEUR:5365, PSY:5365.

NSCI:5653 Fundamental Neurobiology 4 s.h.
Neurobiology from molecular/cellular to systems levels,
including cell biology of neuron; membrane electrophysiology,
synaptic transmission and plasticity, functional neuroanatomy,
sensory systems from periphery to CNS, peripheral and
central motor systems, autonomic systems emotion, memory,
sleep, language, attention and cognition, development of
nervous system; discussion of classic and recent journal
articles. Same as BIOL:5653, PSY:5203.

NSCI:5753 Developmental Neuroscience 1 s.h.
Neural induction and nervous system patterning;
neurogenesis, axon, and dendrite outgrowth and targeting;
synapse formation, specificity, refinement; mechanisms
of neuronal cell death; myelination; neural stem cells;
introduction to cellular, molecular, and genetic techniques in
studies of neural development. Prerequisites: BIOL:5653.
Same as BIOL:5753.

NSCI:6209 Steroid Receptor Signaling 1 s.h.
Structure-function relationship and genomic and nongenomic
actions of the steroid hormone receptor family; basis for
actions of novel new ligands on these receptors. Offered
spring semesters. Same as MB:6209, PCOL:6209.

NSCI:6240 Topics in Cognitive Neuroscience 1-3 s.h.
Key topics in the neural basis of human cognition; research
literature. Recommendations: graduate courses in basic
neuroscience and cognitive psychology. Same as NEUR:6240.

NSCI:6250 Functional Magnetic Resonance Imaging 2-3 s.h.
Basic physics principles of functional magnetic resonance
imaging and approaches to data acquisition, including BOLD
imaging, arterial spin labeling, and magnetic source imaging;
data analysis strategies; paradigm design and development.

NSCI:6265 Neuroscience Seminar 0-1 s.h.
Research presentations. Offered fall and spring semesters.
Same as ACB:6265, BIOL:6265, MPB:6265, PSY:6265.
NSCI:7235 Neurobiology of Disease 3 s.h.
Broad, thematic understanding of disease mechanisms in neurobiological disorders.

NSCI:7301 Directed Study in Neuroscience arr.
NSCI:7305 Neuroscience Research arr.
Requirements: neuroscience graduate standing.