2023-2024  MCB Area of Interest Course Information
Neuroscience

Please check the University of Washington Time Schedule for the most updated course information.

FOUNDATIONAL COURSES

Foundational Course One:

Course Number: NEURO 501  
Course Title: Introduction to Neurobiology  
Instructor (s): Carlson  
Location (e.g., UW, FH, SLU): UW  
Credits: 3  
Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10  
Attributes (e.g., graded, lecture-based): Lecture-based  
Sub Area (if applicable):  
Synopsis: Survey of molecular, cellular, and developmental neuroscience, including gene regulation, the cytoskeleton, protein sorting in the secretory pathway, growth factors, and neurotransmitter receptors. Includes lecture discussion of original literature.  
Note: Must email instructor for permission.

Foundational Course Two:

Course Number: NEURO 504  
Course Title: Biophysics of Nerve, Muscle, and Synapse  
Instructor (s): Sullivan  
Location: UW  
Credits: 3  
Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10  
Attributes: Lecture-based  
Sub Area (if applicable): Cell signaling  
Synopsis: Introduces biophysical properties of nerve and muscle cells. Topics include intrinsic electrical properties of neurons, ion channels, receptor signaling, calcium signaling, contraction of muscles, and synaptic function.

Foundational Course Three:

Course Number: NEURO 548  
Course Title: Molecular Mechanisms of Synaptic Plasticity  
Instructor (s): TBD  
Location: UW  
Credits: 2  
Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-5, even years, will be offered in Spring 2024  
Attributes: Literature review, discussion  
Sub Area (if applicable):  
Synopsis: Discusses recent primary literature on the molecular mechanisms underlying structural and functional changes of dendritic spines and synapses in the mammalian brain as result of synaptic activity and experience.

Updated October 2023
ELECTIVE COURSES

Elective Course One:
Course Number: CONJ 531
Course Title: Signaling Mechanisms in Excitable Cells
Instructor(s): Zagotta, Gordon, Asbury
Location: UW
Credits: 1.5
Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-5
Attributes: Lecture-based
Sub Area (if applicable):
Synopsis: Mechanisms of cellular signaling, particularly in nerve and muscle. Electrical, chemical, and mechanical signaling in the cell that lead to processes such as electrical excitability, action potentials, and muscle contraction.
Prerequisite(s): Comprehensive undergraduate course in general biochemistry and molecular biology, or permission of instructor.

Elective Course Two:
Course Number: CONJ 532
Course Title: Signal Transduction from the Cell Membrane to the Nucleus
Instructor(s): Ong
Location: UW
Credits: 2
Quarter, Weeks, and Frequency course is offered: Autumn, weeks 6-10
Attributes: Lecture-based
Sub Area (if applicable):
Synopsis: Intracellular signaling pathways leading from cell membrane receptors to nucleus. Pathways activated by seven transmembrane receptors and G-proteins, insulin/PI3 kinase, MAPKs, and WNTs and mechanisms of signal termination. Cytokine/Jak/Stat signaling and role of subcellular localization in signal transduction.

Elective Course Three:
Course Number: CONJ 544
Course Title: Protein Structure, Modification, and Regulation
Instructor(s): Stoddard, Campbell, Bradley
Location: FH
Credits: 1.5
Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-5, odd years, will be offered in Winter 2025
Attributes: Lecture, literature review, methods
Sub Area (if applicable):
Synopsis: Overview of general principles of protein structure, including forces that contribute to folding and stabilization (in week 1), followed by comparative presentation of the primary means by which protein structure and function are studied (NMR, Crystallography, CryoEM and Computational Structure Prediction and modeling) in weeks 2 through 5. The course is intended for molecular and cellular biology student without a background or ongoing research training or experience in structural analyses. The course will introduce students to the basic principles,
differences and similarities between different approaches for structural analyses, and will use examples from the recent literature to learn how to evaluate and exploit such studies.

Elective Course Four:

Course Number: CONJ 556
Course Title: Drug Addiction: Mechanisms, Prevention, and Treatment
Instructor (s): Ferguson
Location: UW
Credits: 2
Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10, even years, will be offered in Winter 2024
Attributes: Literature and discussion based
Sub Area (if applicable):
Synopsis: Key advances, insights, methods, and challenges for our understanding of drug addiction from psychological, pharmacological, psychiatric, community prevention, legal, and neurodevelopmental perspectives. Enhances familiarity with the multidisciplinary approaches required to understand addiction as a disease.

Elective Course Five:

Course Number: NEURO 503
Course Title: Cognitive And Integrative Neurobiology
Instructor (s): TBD
Location: UW
Credits: 4
Quarter, Weeks, and Frequency course is offered: Dependent on department availability, not currently offered in 2023-2024
Attributes: Lecture, Literature review, discussion
Sub Area (if applicable):
Synopsis: Survey of all aspects of neuroscience, including a discussion of higher neural processes like motivation, decision making, attention, learning, and memory. Lecture and discussion of original literature.
Note: Must email instructor for permission.

Elective Course Six:

Course Number: NEURO 511
Course Title: Seminar in Neurobiology and Behavior
Instructor (s): Phillips, Stuber
Location: UW
Credits: 2
Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10
Attributes: Literature review, discussion-based
Sub Area (if applicable):
Synopsis: Weekly faculty lectures, student presentations, and discussions of past and current scientific literature in neurobiology and behavior.

Elective Course Seven:

Course Number: PHCOL 534
Course Title: Molecular Basis of Addictive Drug Action
Instructor (s): Chavkin, Bruchas
Location: UW
Credits: 2
Quarter, Weeks, and Frequency course is offered: Autumn, 1-10, even years, will be offered in Autumn 2024
Attributes: Literature, discussion-based
Sub Area (if applicable):
Synopsis: Advanced consideration and discussion of current research literature addressing the basis of opioid, psychostimulant, and cannabinoid effects on signal transduction events, electrical activity of neurons, and drug-motivated behaviors in animal models of human substance use disorder.
Prerequisite(s): PHCOL 512 or permission of instructor.

Elective Course Eight:
Course Number: PHCOL 537
Course Title: Molecular Neurobiology of the Cell Membrane
Instructor (s): Nathanson
Location: UW
Credits: 2
Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10, odd years, will be offered in Winter 2025
Attributes: Discussion-based, student led lectures
Sub Area (if applicable):
Synopsis: This graduate level course covers the cell biology of eukaryotic cell membranes and how they contribute to normal functioning and disease. Students will take turns introducing weekly topics and will participate in discussions of 2-3 papers assigned for each class.