

# NEUROSCIENCE (NSC)

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## NSC 5600 Behavioral Neurology (3 Credits)

TBD (993: Fall, Winter, Spring) – The Behavioral Neurology course curriculum provides a comprehensive overview of the neuropathological, genetic, clinical characteristics (e.g., phenotypes, diagnosis, treatment), and radiographic features of neurodegenerative diseases. The course will feature the most current knowledge about each disease, including therapies available or ongoing research on the causes of the disorder. The course features weekly lectures and will be assessed based on attendance and participation.

Grading: Sat / Unsat

## NSC 6210 Neurobiology of Disease (3 Credits)

A. Siddiqui (Odd: Spring, Summer) – This course is designed for graduate students (Ph.D. and M.S.), residents, clinical fellows, and postdoctoral fellows in neuroscience/neurology and clinical translational science training programs. It is intended to confer a detailed mechanistic understanding of the genetic, pathological and cell biological basis of important neurological diseases and syndromes. The clinical and scientific background and context for each disease will also be provided and therapeutic rationales will be discussed along with current mechanisms and modeling (cellular or model organisms). The focus will be on research-oriented students, but this course will also provide a mechanistic understanding for clinically oriented students. Basic science and clinical experts from all three Mayo campuses will provide this didactic survey course. These 90-minute lectures will be on Tuesday afternoons, from 4:00pm-5:30pm EST. A two-page proposal on a student-selected disease entailing a brief background, importance, and two specific aims will be due at the end of each term. This course will span two quarters (January to June).

Grading: Standard Letter

## NSC 6250 Skills for Effective Presentations (2 Credits)

O. Ross (Fall) – The purpose of this course is to instruct students on critical presentation skills that can be applied to journal club, works-in-progress presentations, and future speaker opportunities. In addition, students will discuss how to critically evaluate published manuscripts and effectively communicate the findings in ways that will keep a journal club audience engaged and encourage discussion. Target audience is first year NSC track students, although it is open to all students.

Grading: Sat / Unsat

## NSC 6310 Methods in Neuroscience Research (2 Credits)

P. McLean (993: Spring, Summer) – The purpose of this course is to give an overview of commonly used lab techniques in neuroscience research. Students should plan to register for the course in the spring quarter of Year 1 just after choosing a thesis mentor and when beginning to think about thesis projects. This is a 2-quarter course that will run through the end of summer quarter. This will be a team-taught course with a mid-term and final exam.

Grading: Standard Letter

## NSC 6401 Practical Neuroanatomy (2 Credits)

M. Murray (Odd: Spring) – This course is designed to provide a fundamental understanding of neuroanatomical nomenclature and the structure and function of the human nervous system. The emphasis is on practical application of neuroanatomical knowledge for research-oriented students. This course is appropriate for students in all tracks who want to increase their knowledge of Neuroanatomy. Course detail: (1) The course is laboratory based. There will be ten 3-hour lecture/ laboratory sessions. (2) Students will view at least one brain cutting session with a Mayo Neuropathologist and one Neuro Histopathology review. (3) Students will write a mini review of an area of Neuroanatomical interest. NSC 6401 is waived for M.D.-Ph.D. students in the NSC Track (and PhD students with existing MD if pass WQE).

Grading: Standard Letter, Test-Out/Waivers

## NSC 6600 Neuroscience Journal Club (1 Credit)

Da Mequita, B. Clarkson (993: Fall, Winter, Spring, Summer) – This multifaceted course will address current topics in neuroscience and will emphasize dynamic interactions between students and faculty. Each quarter two to three focused topics will be covered in depth through a series literature reviews and presentations by the students. One credit will be given per year for years 1 and 2 and every student is required to present and participate each quarter in years 1 through 4. Register for this course fall quarter only of years 1-2 (1 cr. /yr.). Attendance required fall, winter, and spring all years.

Grading: Sat / Unsat

## NSC 6650 Neuroscience Works In Progress (1 Credit)

Da Mesquita, B. Clarkson (993: Fall, Winter, Spring, Summer) – Presentation of ongoing research projects by graduate students in the Neuroscience Ph.D. Program. One credit will be given per year and every student is required to present a WIP each year in years 2 – 5. Register for this course fall quarter only of years 2-3 (1 cr. /yr.). Attendance required fall, winter, and spring all years.

Grading: Sat / Unsat

## NSC 6854 Basic Neuroscience (5 Credits)

E. Benarroch – The Basic Neuroscience course consists of a series of didactic lectures and question and answer sessions covering basic molecular, cellular, neurochemical and physiological aspects of the organization of the nervous system, with an emphasis on clinical correlations. The course is intended to provide neurology and neurosurgery residents and neuroscience graduate students with basic information on the organization of the nervous system at the molecular, cellular, synaptic, and system levels. The course will also provide information that will allow clinical trainees to understand and critically analyze the increasing number of papers in the neurologic literature that address basic mechanisms of disease and therapeutic approaches. Finally, the course will provide an overview of the spectrum of neurologic disease that will allow basic science trainees to put their specific research projects in the context of potential clinical relevance.

Grading: Standard Letter

**NSC 6857 Systems Neuroscience and Behavior (3 Credits)**

S. Lucio Boschen De Souza, C. Blaha (Winter) - The purpose of this course is to provide graduate students with a basic understanding of the neural basis of behavior. As virtually all behavior can be related to the functioning of the brain and nervous system, this course is essentially about these systems. Topics to be covered will include neuroanatomy, neurophysiology, neuropsychological methods, sensory systems, psychiatric disorders, motor disorders, and neurodegenerative diseases. This course is designed to provide a foundation of neuroscience understanding for graduate students. The course will have a strong research orientation but where appropriate, specific disease states and clinical perspectives will be highlighted.

Grading: Standard Letter

**NSC 6862 Molecular and Cellular Neuroscience (3 Credits)**

S. Lucio Boschen De Souza, C. Blaha (Fall) – This course will present didactic and literature-based training in molecular and cellular neuroscience. The aim of the course is to help students gain an understanding of the molecular basis of neuronal and glial function. Topics to be covered will include neuronal and glial cell biology, ion channels and the generation of membrane potential, the electrical properties of neurons, neurotransmitters, and neurotransmitter release, and second messenger signaling.

Grading: Standard Letter

**NSC 6900 NSC Thesis Proposal (2 Credits)**

O. Ross (Fall, Winter, Spring, Summer) – Thesis proposal: The written thesis proposal matches the format of NIH F31 grants and, hence is limited to 7 pages, including figures but not references. In the student's own words, the proposal should outline the rationale for the proposed project and how it is to be executed. The proposal is subdivided into the following sections. Abstract: Summary of the project (1 page) Specific Aims: Briefly describe the aims and hypotheses of your project (1/2 page). Significance: Put your project into context with what is known about this area of neuroscience and demonstrate the significance of the questions you are asking (1 page) Innovation: How is the proposed project novel and groundbreaking (1/2 page) Approach: Describe what you plan to do and how you plan to do it. Include preliminary data for each aim that supports your question and hypothesis (4 pages). Register for credit the quarter AFTER you have presented your proposal and passed your qualifying oral exam.

Grading: Sat / Unsat