What is Molecular/Cellular Neuroscience?

Molecular/Cellular Neuroscience is a subfield of neuroscience that examines the mechanisms related to the basic biological processes of neurons and support cells of the nervous system. Molecular/Cellular neuroscientists tend to study how neurons communicate, how parts of neurons (e.g., axons and dendrites) function, and explore the anatomy/physiology of neurons.

DECLARATION REQUIREMENTS

In order to declare the major, students must meet with a Neuroscience Advisor to discuss the requirements. To set up an appointment:

1. Stop by room 10 of Townshend Hall
2. Give us a call at (614) 292-8512
3. E-mail us at NeuroAdvising@osu.edu
4. Schedule an appointment: https://neuroscience.major.osu.edu/advising/declare

Contact Us
Neuroscience Undergraduate Program
College of Arts & Sciences and College of Medicine
10 Townshend Hall
1885 Neil Avenue Mall
Columbus, OH 43210
Phone: (614) 292-8512
http://neurosciencemajor.osu.edu

Form Last Updated: SP23

The Neuroscience Undergraduate Program is a selective admissions major. All students must complete Neuro 1100H, Psych 3313 and Neuro 3000 with grades of ‘B’ or higher and earn a minimum 3.0 cumulative GPA.

The requirements for the 36 semester hour (12 classes) neuroscience major are distributed across four categories: Core, Data Analysis, Specialization, and Breadth.

I. PROFESSIONAL SURVEY
Take the course below

- Neuro 1100H Neuroscience Honors Survey
  1hr | Au, Sp | (Pre-req: Full or Pre-Majors Only)

II. CORE REQUIREMENTS
Take all 4 of the courses below

- Psych 3313 Introduction to Behavioral Neuroscience
  3hrs | Au, Sp, Su | (Pre-req: Psych 1100)
- Neuro 3000 Introduction to Molecular/Cellular Neuroscience
  3hrs | Au, Sp | (Pre-req: Bio 1113 and Pre-Major)
- Psych 3513 Introduction to Cognitive Neuroscience
  3hrs | Au, Sp | (Pre-req: Psych 1100)
- Neuro 3050 Structure & Function of the Nervous System
  3hrs | Au, Sp | (Pre-req: Bio 1113 & Neuro 3000)

III. DATA ANALYSIS REQUIREMENT
Take 1 of the 4 courses below

- Psych 2220 Introduction to Data Analysis in Psychology
  3hrs | Au, Sp, Su | (Pre-req: Psych 1100 & Math 1140)
- Stats 2480 Statistics for Life Sciences
  3hrs | Sp | (Pre-req: Math 1151)
- Stats 2450 Introduction to Statistical Analysis
  3hrs | Au, Sp | (Pre-req: Math 1151)

IV. SPECIALIZATION REQUIREMENTS
Choose at least 5 specialization courses from the options below

- Neuro 4550 Autism Spectrum Disorder & Neurodev Disorders
  3hrs | Au | (Pre-req: Neuro 3000)
- Neuro 4425 Neurotrauma: TBI, Stroke, & Spinal Cord Injury
  3hrs | Sp | (Pre-req: Neuro 3000)
- Neuro 3010 Neurophysiology
  3hrs | Au | (Pre-req: Neuro 3000 & Neuro 3050)
- Neuro 3305 Neuropharmacology
  3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)
- Neuro 4050H Neurogenetics
  3hrs | Au | (Pre-req: Neuro 3000)
- Neuro 4100 Basic & Clinical Foundations of Neuro Disease
  3hrs | Au | (Pre-req: Neuro 3000)
- Neuro 4640 Neuronal Signal Transduction
  3hrs | Sp | (Pre-req: Neuro 3000)
- Neuro 5790H Developmental Neuroscience
  3hrs | Sp | (Pre-req: Neuro 3000 & 3050 & Jr. or Sr.)
- Psych 4644 Hormones & Behavior
  3hrs | Au, Sp | (Pre-req: Psych 3313 & Neuro 3000)
- Psych 5603 Stem Cells and the Brain
  3hrs | Au | (Pre-req: Psych 3313 & Neuro 3000)
- Psych 4305 Introduction to Psychopharmacology
  3hrs | Sp | (Pre-req: Permission of Instructor)
- Biophrm 5824 Pharmacology of the Nervous System
  3hrs | Au, Sp | (Pre-req: Permission of Instructor)
- Chem 5230 Neurotransmitter Chemistry
  3hrs | Sp | (Pre-req: Chem 2540, & 2520)
- Neuro 4623 Biological Clocks & Rhythms
  3hrs | Sp | Spring ’16 ’18 (Pre-req: Neuro 3000)
- Biochem 4511 Intro to Biological Chemistry
  4hrs | Au, Sp, Su | (Pre req: Chem 2510 & Bio 1113)
- MolGen 4500 General Genetics
  3hrs | Au, Sp, Su | (Pre-req: Bio 1113 & 3+ hrs Bio)

https://neurosciencemajor.osu.edu/advising/declare

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V. BREADTH REQUIREMENT

Choose at least 2 additional courses from the list below:

- **Neuro 3025** History of Neuroscience
  3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)

- **Neuro 4850** Contemporary Topics in Neuroscience
  3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)

- **Psych 4501** Advanced Behavioral Neuroscience
  3hrs | Au, Sp | (Pre-req: 3313 & Neuro 3000)

- **Psych 5089** Cognitive Aging, Neurodegen, & Neuroplasticity
  3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)

- **Psych 5613(H)** Biological Psychiatry
  3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)

- **Psych 5602** Behavioral Genetics
  3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)

- **Psych 5604** Sex Differences in the Brain and Behavior
  3hrs | Au | (Pre-req: Psych 3313 & Neuro 3000)

- **Psych 5622** The Development of Brain and Behavior
  3hrs | Au | (Pre-req: Psych 3313 & Neuro 3000)

- **EEOB 4550** Neurobiology of Behavior
  3hrs | Au | (Pre-req: Psych 3313 & Neuro 3000)

- **SHS 5760** Neurology of Speech and Hearing Mechanisms
  3hrs | Au, Sp | (Pre-req: Psych 3313 or 3000)

- **Psych 3321** Quantitative and Statistical Methods in Psych
  3hrs | Au, Sp | (Pre-req: B or higher in 2220)

- **Math 4350** Quantitative Neuroscience
  3hrs | Sp | (Pre-req: Math 1152)

- **Psych 5608** Intro to Mathematical Psychology
  3hrs | Au | (Pre-req: Psych 3321)

- **Psych 5898** Seminar in Behavioral Neuroscience
  3hrs | Sp | (Pre-req: Psych 4501)

- **CSE 5052** Survey of Artificial Intelligence for Non-Majors
  3hrs | Au | (Pre-req: Programming & Neuro 3000)

- **CSE 5526** Introduction to Neural Networks
  3hrs | Au | (Pre-req: CSE 3521)

- **Econ 5870** Neuroeconomics and Decision Neuroscience
  3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)

- **Neuro 4998/3193 Undergraduate Research & Individual Studies**

  Pre-approved required.
  Up to 3 credit hours of any combination of Undergraduate Research (4998) and Individual Studies (3193) can be applied to the breadth requirement.

Honors Requirements

Must take at least one honors or graduate level course. Approved courses can be found here:
http://neurosciencemajor.osu.edu/honors

1. All Students must meet the following requirements to declare the neuroscience major:
   - First, meet with an advisor to officially be declared as a pre-neuroscience major
   - Complete 24 total semester credit hours
   - At least 12 of those semester credit hours must be from graded OSU coursework
   - An overall GPA greater than or equal to 3.0
   - Earn at least a “B” in Psych 3313, Neuro 3000, and Neurosc 1100(H)

2. Thirty-three (33) semester credits in approved Neuroscience coursework.

3. **Honors students** must take at least one honors or graduate level course. Approved courses can be found here:
   http://neurosciencemajor.osu.edu/honors

4. **Honors students** must complete the Pre-Major Requirements

5. For courses to apply toward the major, you must earn at least a “C-”.

6. At least half of the major’s curriculum must be completed at Ohio State.

7. Majors will follow the Bachelor of Science curriculum for Legacy GE and other degree requirements.

8. Students are encouraged to focus on completion of core requirements before beginning their specialization coursework.

9. To earn your degree you will need an overall GPA of at least 2.0.

10. Research experience is also strongly encouraged for students considering graduate and professional training. You may enroll in a variety of 4998 opportunities.
   http://neurosciencemajor.osu.edu/4998

11. Up to 3 credit hours of experiential coursework can be applied to the breadth requirements of the major. This experiential coursework can be from any combination of the following classes: Undergraduate Research (4998), Internships (3191), and Individual Studies (3193). 3 Credits of these courses can be combined to count as one course toward the Breadth Requirements.
   Pre-approval from your neuroscience major advisor is required.

12. Students planning to graduate “With Honors in Arts and Sciences” should visit our website for information on Honors Contract requirements for neuroscience majors.
   http://neurosciencemajor.osu.edu/honors

13. **Honors Requirements**: All Honors students must take at least ONE Neuro Advisor Approved graduate-level course to fulfill their Honors requirement. Honors students must speak with their advisor to select a course. The chosen course to fulfill the requirement can count as EITHER one Breadth course or one Specialization course. The approved graduate-level courses can be found at this link:
   https://NeuroscienceMajor.osu.edu/honors