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.

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
All Full and Pre-major students must complete Neuro 1100(H), Psych 3313(H) and Neuro 3000 with grades of ‘B’ or higher in these classes, and earn a minimum 3.0 cumulative GPA

- **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 3 courses below

- **Psych 2220** Introduction to Data Analysis in Psychology
  3hrs | Au, Sp, Su | (Pre-req: Psych 1100 & Math 1148)

- **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 4 specialization courses from the options below

- **Neuro 4550** Autism Spectrum Disorder & Neurodev Disorders
  3hrs | Au | (Pre-req: Neuro 3000)

- **Neuro 3010** Neurophysiology
  3hrs | Au | (Pre-req: Neuro 3000 & Neuro 3050)

- **Neuro 3305** Neuropharmacology
  3hrs | Sp | (Pre-req: Psych 3131 & 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/MolGen 4500/MicroBio 4000**
  3-4hrs | Au, Sp, Su | (Refer to Course Catalog for Pre-req)

Students can only use ONE of these courses toward the major
Choose 1 course from the list below

**V. BREADTH REQUIREMENT**

- **Neuro 3025** History of Neuroscience 3hrs | Sp | (Pre-reqs: Psych 3313 & Neuro 3000)
- **Neuro 4850** Contemporary Topics in Neuroscience 3hrs | Sp | (Pre-reqs: Psych 3313 & Neuro 3000)
- **Psych 4501** Advanced Behavioral Neuroscience 3hrs | Au, Sp | (Pre-reqs: 3313 & Neuro 3000)
- **Psych 5089** Cognitive Aging, Neurodegen, & Neuroplasticity 3hrs | Sp | (Pre-reqs: Psych 3313 & Neuro 3000)
- **Psych 5613(H)** Biological Psychiatry 3hrs | Sp | (Pre-reqs: Psych 3313 & Neuro 3000)
- **Psych 5602** Behavioral Genetics 3hrs | Sp | (Pre-reqs: Psych 3313 & Neuro 3000)
- **Psych 5604** Sex Differences in the Brain and Behavior 3hrs | Au | (Pre-reqs: Psych 3313 & Neuro 3000)
- **Psych 5622** The Development of Brain and Behavior 3hrs | Au | (Pre-reqs: Psych 3313 & Neuro 3000)
- **EEOB 4550** Neurobiology of Behavior 3hrs | Au | (Pre-reqs: 2 courses in Bio)
- **Ling 3701** Language and the Mind 3hrs | Au, Sp | (Pre-reqs: Psych 1100)
- **Psych/CSE/Ling/Philos 5612** Introduction to Cognitive Science 3hrs | Au | (Pre-req: 12hrs in Psych/CSE/Ling/Philos)
- **Psych 5614** Cognitive Neuroscience 3hrs | Sp | (Pre-req: Psych 3313 or 3000)
- **Psych 5618** Intro to Computational Cognitive Neuroscience 3hrs | Sp | (Pre-req: Psych 3313 & Neuro 3000)
- **Psych 5628** Developmental Cognitive Neuroscience 3hrs | Au | (Pre-req: Psych 3313 or 3000)
- **SHS 5760** Neurology of Speech and Hearing Mechanisms 3hrs | Au, Sp | (Pre-req: Psych 3313 & 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 5521)
- **Econ 5870** Neuroeconomics and Decision Neuroscience 3hrs | Sp | (Pre-req: Psych 3313 & 3000)
- **Neuro 4998/3193** Undergraduate Research & Individual Studies
  Pre-approval required.
  Up to 3 credit hours of any combination of Undergraduate Research (4998) and Individual Studies (3193) can be applied to the breadth requirement.

**VI. NEUROSCIENCE WRITING REQUIREMENT**

Choose at least 1 course from the list below

- **English 3304** Business & Professional Writing 3hrs | Au, Sp, | (English 1110.XX)
- **English 3305** Technical Writing: Science and Engineering Majors 3hrs | Au, Sp | (English 1110.XX)

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**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