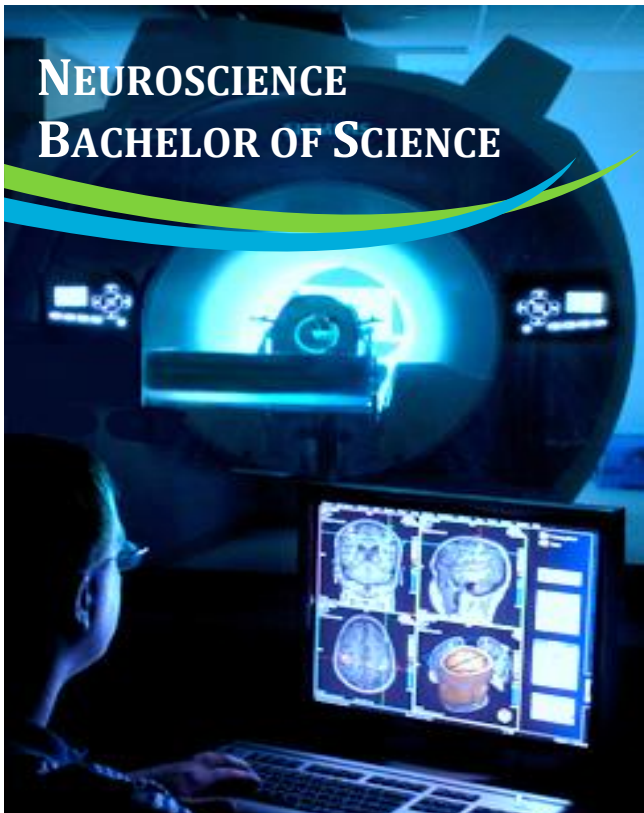# NEUROSCIENCE BACHELOR OF SCIENCE

What is Cognitive/Computational Neuroscience?

Cognitive/Computational neuroscience is a subfield of neuroscience that studies the neural mechanisms that underlie mental processes.

Cognitive/Computational neuroscientists tend to study how specific areas of the brain are related to thought and sensory processing, create mathematical models to understand cognitive processes, and may conduct research in areas of artificial intelligence.

DECLARATION REQUIREMENTS

In order to declare the pre-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. **Attend an Info Session**
   NeuroscienceMajor.osu.edu/declare

Cognitive/Computational Specialization

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

I. CORE REQUIREMENTS
Take all 4 of the courses below

Pre-major students must complete Psych 3313 and Neuro 3000 with grades of 'B' or higher in both classes and earn a minimum 3.0 cumulative GPA

- **Psych 3313   Introduction to Behavioral Neuroscience**
  3hrs | Au, Sp, Su | (Pre-reqs: Psych 1100)

- **Neuro 3000   Introduction to Molecular/Cellular Neuroscience**
  3hrs | Au, Sp | (Pre-reqs: Bio 1113)

Students must complete Psych 3513 and Neuro 3050 with a 'C' or higher in both classes

- **Psych 3513   Introduction to Cognitive Neuroscience**
  3hrs | Au, Sp | (Pre-reqs: Psych 1100)

- **Neuro 3050   Structure & Function of the Nervous System**
  3hrs | Au, Sp | (Pre-reqs: Bio 1113 & Neuro 3000)

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

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

- **Stats 2480   Statistics for Life Sciences**
  3hrs | Sp | (Pre-reqs: Math 1151)

- **Stats 2450   Introduction to Statistical Analysis**
  3hrs | Au | (Pre-reqs: Math 1151)

- **MolGen 5650   Analysis & Interpretation of Biological Data I**
  3hrs | Au | (Pre-reqs: Math 1150 & 10hrs 3000-level Bio)

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

- **Econ 5870   Neuroeconomics and Decision Neuroscience**
  3hrs | Sp | (Pre-reqs: Stat 2450 & Psych 3313)

- **Math 4350   Quantitative Neuroscience**
  3hrs | Sp | (Pre-reqs: Math 1151 &1152)

- **Ling 3701   Language and The Mind**
  3hrs | Au, Sp | (Pre-reqs: Psych 1101)
  | Au, Sp | (Honors Version)

- **Philos 5840   Advanced Philosophy of Cognitive Science**
  3hrs | Au, Sp | (Pre-reqs: Psych 1100)

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

- **Psych 5600   Psychobiology of Learning & Memory**
  3hrs | Au | (Pre-reqs: Psych 3313 & Neuro 3000)

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

- **Psych/CSE/Ling/Philos 5612   Introduction to Cognitive Science**
  3hrs | Au, Sp, Su | (Pre-reqs: 12hr in Psych/CSE/Ling/Philos)

- **Psych 5614   Cognitive Neuroscience**
  3hrs | Au | (Pre-reqs: Psych 3313 and Neuro 3000)

- **SHS 5760   Neurology of Speech and Hearing Mechanisms**
  3hrs | Au, Sp | (Pre-reqs: Permission of Instructor)

- **CSE 5052   Survey of Artificial Intelligence for Non-Majors**
  3hrs | Au | (Pre-reqs: Psych CSE 2221)

IV. BREADTH REQUIREMENT

Choose at least 2 additional courses from the list below

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

- **Psych 4305** **Intro to Psychopharmacology**
  3hrs | Au, Sp | (Pre-reqs: Psych 3313 and Neuro 3000)
  Not Open to Students With Credit For Psych 3305

- **Psych 5602** **Behavioral Genetics**
  3hrs | Sp | (Pre-reqs: B or higher in 3313 and Neuro 3000)

- **Psych 5898** **Seminar in Behavioral Neuroscience**
  3hrs | Au | (Pre-reqs: Psych 4501 & Instructor Consent)

- **Neuro 4623** **Biological Clocks & Behavior**
  3hrs | Sp | Spring '16, '18 (Pre-reqs: Psych 3313)

- **Psych 4644** **Hormones & Behavior**
  3hrs | Sp | (Pre-reqs: Psych 3313 and Neuro 3000)
  Not Open to Students With Credit For Neuro 5644

- **Psych 5603** **Stem Cells and the Brain**
  3hrs | Au | (Pre-reqs: Psych 3313 and Neuro 3000)

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

- **Neuro 3010** **Neurophysiology**
  3hrs | Au | (Pre-reqs: Neuro 3000)

- **Neuro 4050H** **Neurogenetics**
  3 hrs | Au | (Pre-reqs: Neuro 3000)

- **Neuro 4100** **Basic & Clinical Foundations of Neurological Disease**
  3 hrs | Au | (Pre-reqs: Neuro 3000)

- **Neuro 4640** **Neuronal Signal Transduction**
  3hrs | Sp | (Pre-reqs: Neuro 3000 & 3050)

- **Neuro 5790H** **Developmental Neuroscience**
  3hrs | Sp | (Pre-reqs: Neuro 3000 & 3050)

- **EEOB 4550** **Neurobiology of Behavior**
  3hrs | Au | (Pre-reqs: 2 courses in Bio)

- **MolGen 4500** **General Genetics**
  3hrs | Au, Sp, Su | (Pre-reqs: Bio 1113 & 3+ hrs Bio)
  | Au, Sp | (Honors Version)

- **Biochem 4511** **Intro to Biological Chemistry**
  4hrs | Au, Sp, Su | (Pre-reqs: Chem 1210/1220 & 2510)

- **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. **3**

HONORS REQUIREMENT

All honors students are required to take at least one approved graduate level course. This course should be selected in conjunction with your honors advisor. A complete list of honors and graduate level courses offered can be found online at
https://neurosciencemajor.osu.edu/honors.

Important information about the Neuroscience Major

1. **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 and Neuro 3000

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

3. Thirty-six (36) semester credits in approved Neuroscience coursework.

4. At least half of the major's curriculum must be completed at Ohio State.

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

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

7. For courses to apply toward the major, you must earn at least a " **C** ".

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

9. 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

10. Up to 3 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) and Individual Studies). Pre-approval from your neuroscience major advisor is required.

11. 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

12. Courses cannot count for both a minor and a major.