

Bachelor of Science in Neuroscience

Concentrations in Cognitive Neuroscience, Neurobiology or Computational Neuroscience

The Dietrich College of Humanities & Social Sciences and the Mellon College of Science have joined forces to establish an interdisciplinary program leading to a Bachelor of Science in Neuroscience. Students will gain a broad understanding of Neuroscience at many different levels of analysis, including cellular biology of the brain, brain systems, cognitive brain function, and computational brain modeling.

Students will need to complete one of the three concentrations: Cognitive Neuroscience, Neurobiology or Computational Neuroscience. Students may only double count 3 courses from the Core Neuroscience courses and concentration area of the major with another major or minor. If you have problems scheduling or course requirements, please reach out to Emilie O'Leary emilier@andrew.cmu.edu.

Please contact Emilie O'Leary (emilier@andrew.cmu.edu) or Dr. Erik Thiessen (thiessen@andrew.cmu.edu) with further questions.

General Science Requirements

21-120 Differential & Integral Calculus
21-122 Integration & Approximation
Or 21-124 Calculus II for Biologists and Chemists
03-121 Modern Biology
03-220 Genetics
33-111 Physics 1 for Science Students
Or 33-141 Physics for Engineering Students
15-110 Principles of Computing
Or 15-112 Fundamentals of Prog & CS
09-105 Introduction to Modern Chemistry
09-106 Modern Chemistry II
09-217 Organic Chemistry I
09-207 Techniques in Quantitative Analysis
Or 03-124 Modern Biology Laboratory
36-200 Reasoning with Data
Or 36-219 Probability Theory and Random Processes*

*Does not count towards Dietrich Gen Edu

Core Neuroscience Courses

85-219 Biological Foundations of Behavior
Or 03-161 Molecules to Mind
85-211 Cognitive Psychology
Or 85-213 Human Information Processing and AI
03-362 Cellular Neuroscience
03-363 Systems Neuroscience
85-419 Intro to Parallel Distributed Processing
Or 85-435 Biologically Intelligent Exploration
Or 15-386 Neural Computation
Or 86-375 Computer Perception
Or 02-319/ 03-360 Computational Neural Genomics

Cognitive Neuroscience Concentration

Cognitive Core

85-102 Introduction to Psychology
36-309 Exper. Design for Behavioral & Social Sciences
Or 85-309 Stats Concepts and Methods for Behavioral
& Social Science
85-314 Research Methods in Cognitive Neuro
85-310 Cognitive Research Methods

Cognitive Electives

Must complete three of the following

85-221 Principles of Child Development
85-241 Social Psychology
85-104/261 Abnormal Psychology
85-356 Music and Mind: The Cog Neuro of Sound
85-370 Perception
85-371 Perception and Consciousness
85-385 Auditory Perception
85-390 Human Memory
85-406 Autism: Psychological & Neuro Perspectives
85-408 Visual Cognition
85-412 Cognitive Modeling
85-414 Cognitive Neuropsychology
85-419 Intro to Parallel Distributed Processing
85-424 Hemispheric Specialization
85-429 Cognitive Brain Imaging
85-442 Health Psychology
85-501 Stress, Coping and Well-Being

18 units of general Neuroscience elective
Approved courses can be found on the neuro website
with at
least one course being 300 level or higher.

Neurobiology Concentration

Neurobiology Core

03-231 Honors Biochemistry
03-320 Cell Biology
03-343 Experimental Tech in Molecular Bio
03-346 Experimental Neurobiology
Or Experimental Cell & Dev Biology

Neurobiology Electives

Must complete two of the following with at least one
being 300 level or higher

03-250 Intro to Computational Biology
03-133 Neurobiology of Disease
03-350 Developmental Biology
03-365 Neural Correlates of Learning & Memory
03-366 Biochemistry of the Brain
03-439 Biophysics
03-442 Molecular Biology
09-218 Organic Chemistry II
09-222 Lab II: Organic Synthesis & Analysis
42-202 Physiology
42-203 Biomedical Engineering Lab
NROSCI 1041 Dev Neuroscience (UofPitt)

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higher.

Computational Neuroscience Concentration

Computational Core

15-122 Principles of Imperative Computation
Or 15-150 Principles of Functional Programming
21-127 Concepts of Mathematics
21-241 Matrices and Linear Transformations

Two of the following

85-419 Parallel Distributed Processing
85-435 Biologically Intelligent Exploration
42-631 Neural Data Analysis
42-632 Neural Signal Processing
15-486 Artificial Neural Networks
15-494 Special Topics: Cognitive Robotics
15-883 Computational Models of Neural Systems

Computational Electives

One of the following

02/03-512 Comp Methods for Bio Mod & Simulation
10-401 Machine Learning
15-381 AI: Representation & Problem Solving
15-387 Computational Perception
15-451 Algorithm Design and Analysis
15-453 Formal Languages, Automata & Computability
15-486 Artificial Neural Networks
15-494 Special Topics: Cognitive Robotics
15-883 Computational Models of Neural Systems
16-299 Intro to Feedback Controls Systems
16-311 Introduction to Robotics
21-228 Discrete Mathematics
Or 15-251 Great Theoretical Ideas in CS
21-259 Calculus in 3D
21-341 Linear Algebra
21-272 Intro to Partial Differential Equations
36/70-208 Regression Analysis
36-226 Introduction to statistical Inference
36-350 Statistical Computing
36-401 Modern Regression
36-462 Topics in Statistics: Data Mining
42-631 Neural Data Analysis
42-632 Neural Signal Processing
85-412 Cognitive Modeling

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with at least one course being 300 level or higher.