

Graduation Requirements for the Major Prior to Fall 2021

Thirty credits in the major are required for a BA in Neuroscience with at least a 2.500 GPA in the major. Students are dropped from the major if they fall below a cumulative GPA of 2.500 for all designated neuroscience courses. Core courses for the major include two semesters of a capstone neuroscience seminar class, which are typically completed in the third year, and three additional didactic courses. The remaining courses needed to reach the 30-credit requirement include three upper level Biology and/or Psychology classes, and typically two additional electives. Third year students are required to conduct research and must complete both terms of NESC 3960. Hours for NESC 3960 do not count toward the 30 credits for the major, but do provide 3 credits each toward the 120 credits required for graduation from UVA with a Bachelors degree. Fourth year students are strongly encouraged to continue their research, particularly by entering the Distinguished Major Program (DMP; see below). Research courses (NESC 3960, 4960, 4970 and 4980) and the Distinguished Major thesis do not count toward the 30 credits for the major, but do provide 3 credits each toward the 120 credits required for graduation from UVA with a Bachelors degree.

Courses Required for a Major in Neuroscience

A total of 30 graded course credits is required to graduate.

Prerequisites: To apply for the major, students must be enrolled in, or have already completed, the following courses and have a C+ or better in all courses or equivalent courses:

- BIOL 2100 Introductory Biology
- PSYC 2200 A Survey of the Neural Basis of Behavior **or** BIOL 3050 Introduction to Neurobiology*
- CHEM 1410 Introductory College Chemistry
- CHEM 1420 Principles of Chemistry
- CHEM 1411 Chemistry Laboratory
- CHEM 1421 Chemistry Laboratory
- MATH 1210 Applied Calculus I or MATH 1310 Calculus I (MATH 1310 is strongly recommended)

*You may receive credit for either BIOL 3050 or PSYC 2200 as a pre-requisite but not both.

Note: PSYC 2200 or BIOL 3050 can count toward the 30 required credits for the major. Credits obtained as Chemistry and Math requirements do not count toward the 30 credits for the major. Up to two CHEM requirement courses can be replaced with other 1000 or 2000 level courses offered in the Physics, Statistics, Engineering or Computer Science departments, demonstrating a student's strength in basic sciences that are relevant to neuroscience. Substitute courses should be discussed with the director prior to program application.

Neuroscience Required Courses That Do Not Count toward 30 credits

NESC 3960: Research in Neuroscience – 1st semester for 3rd year students

NESC 3960: Research in Neuroscience – 2nd semester for 3rd year students

NESC 4970: Distinguished Majors Thesis – 1st semester for 4th year students (required for distinguished major only)

NESC 4980: Distinguished Majors Thesis – 2nd semester for 4th year students (required for distinguished major only)

Neuroscience Major Core Courses

The following courses are required for the major and count toward the 30 credits requirement.

- BIOL 3000 Cell and Molecular Biology
- BIOL 4310 or BIOL 4280 or BIOL 4660 or BIOL/PSYC/NESC 4265 or PSYC 4200
- NESC 3980 Current Topics in Neuroscience (required of all 3rd year majors)
- NESC 3985 Current Topics in Neuroscience (required of all 3rd year majors)

Upper Level Courses

At least three upper level Biology or Psychology courses are required

NESC 4245 Neuroscience Through Nobels

NESC 4265 Developmental Neurobiology (also cross listed in past as BIOL 4265 and PSYC 4265)

BIOL 4015: Neural Development Laboratory: From Stem Cells to Neuronal Circuitry

BIOL 4040: Laboratory in Cell Biology

BIOL 4120: When Good Cells Go Bad

BIOL 4190: Biological Clocks

BIOL 4260: Cellular Mechanisms

BIOL 4280: The Genetic Basis of Behavior

BIOL 4310: Sensory Neurobiology

BIOL 4320: Signal Transduction: How Each Cell Talks to Each Other

BIOL 4340: Experimental Foundations in Neurobiology

BIOL 4560: Electric Crayfish: Elements of Neurophysiology

BIOL 4660: How Do They Do It? Method and Logic in Biomedical Science

PSYC 4200: Neural Mechanisms of Behavior

PSYC 4215: Computational Methods in Psychology and Neuroscience (new number)

PSYC 4250: Brain Systems Involved in Memory

PSYC 4255: Behavioral Epigenetics

PSYC 4270: Neurobiology of Learning and Memory

PSYC 4420: Brain Mapping with MRI (new number)

PSYC 4585: Behavior Genetics

PSYC 4755: Social Neuroscience

PSYC 5265: Functional Neuroanatomy

PSYC 5270: Computational Neuroscience

PSYC 5280: Neuropsychopharmacology

PSYC 5325: Cognitive Neuroscience

PSYC 5355: Neurobiology of Speech and Language

Upper Level Classes approved for a specific term only:

PSYC 3559 How to Build a Healthy Brain (January 2021)

BIOL 4011 - 001 Homeostasis: The Wisdom of the Body (Spring 2021)

PSYC 4500 - 002 The Neurogenerative Experience (Spring 2021)

PSYC 5500 - 001 Applications of Brain Mapping with MRI (Spring 2021)

BIOL 4559: Neurodegenerative Diseases (Fall 2021)

Elective Courses

Additional 3 credit elective courses are required to reach 30 hours

BIOL 3010: Genetics and Molecular Biology

BIOL 3030: Biochemistry

BIOL 3040: Development and Regenerative Biology

BIOL 3050: Introduction to Neurobiology (can be an elective if PSYC 2200 taken first)

BIOL 3240: Introduction to Immunology

BIOL 3250: Introduction to Animal Behavior

BIOL 4000: Laboratory in Molecular Biology

BIOL 4005: Functional Genomic Screening to Identify Disease Mechanisms & Treatment

BIOL 4015: Neural Development Laboratory: From Stem Cells to Neuronal Circuitry

BIOL 4040: Laboratory in Cell Biology

BIOL 4050: Developmental Biology

BIOL 4060: Organ Development and Tissue Engineering

BIOL 4070: Developmental Biology Laboratory

BIOL 4120: When Good Cells Go Bad

BIOL 4140: NextGen Sequencing and Its Applications

BIOL 4180: Behavioral Ecology

BIOL 4190: Biological Clocks

BIOL 4210: Genome Sciences: The DNA Revolution in Science and Society

BIOL 4220: Introduction to Systems Biology

BIOL 4230: Bioinformatics and Functional Genomics

BIOL 4250: Human Genetics

BIOL 4260: Cellular Mechanisms

BIOL 4270: Animal Behavior Laboratory

BIOL 4280: The Genetic Basis of Behavior

BIOL 4310: Sensory Neurobiology (Prerequisite: BIOL 3050 (formerly BIOL 3170) or PSYC 2200)

BIOL 4320: Signal Transduction: How Each Cell Talks to Each Other

BIOL 4335: Functional Organization of Sensory Systems

BIOL 4340: Experimental Foundations in Neurobiology

BIOL 4360: Cytokine Signaling and Neural Development (1 Unit)

BIOL 4365: How to Map a Brain

BIOL 4560: Electric Crayfish: Elements of Neurophysiology

BIOL 4660: How Do They Do It? Method and Logic in Biomedical Science (Prerequisite: BIOL 3010)

BIOL 4770: Synthetic Biology

BIOL 5070: Practical Aspects of Light Microscopy in the Biomedical Sciences

CHEM 3721: Analytical Chemistry Laboratory

CHEM 4410: Biological Chemistry I

CHEM 4411: Biological Chemistry Laboratory I

CHEM 4420: Biological Chemistry II

CHEM 4421: Biological Chemistry Laboratory II

BME 3636: Neural Network Models of Cognition and Brain Computation

PSYC 3100 Learning and the Neuroscience of Behavior

PSYC 3210: Psychobiology Laboratory

PSYC 3260 Hidden Figures: Brain Science through Diversity

PSYC 4155: Autism: From Neurons to Neighborhoods

PSYC 4200: Neural Mechanisms of Behavior

PSYC 4250: Brain Systems Involved in Memory

PSYC 4255: Behavioral Epigenetics

PSYC 4270: Neurobiology of Learning and Memory

PSYC 4585: Behavior Genetics

PSYC 4607: Uniquely Human Social Cognition

PSYC 4755: Social Neuroscience

PSYC 5215: Neuroplasticity and Perception/Cognition/Behavior

PSYC 5265: Functional Neuroanatomy

PSYC 5355: Neurobiology of Speech and Language

PSYC 5705: Introduction to Bayesian Methods