NeuroscienceMinor

Neuroscience Minor

Neuroscience embodies the liberal arts experience because it draws on techniques and findings from several academic disciplines including biology, chemistry, computer science, exercise and sports science, mathematics, physics, and psychology. The neuroscience minor provides undergraduate students the opportunity to obtain fundamental knowledge and exposure needed to pursue careers and post-graduate studies in fields related to psychology, human development and aging, health and disease, rehabilitation, biomedical research, human-machine interactions, and other emerging disciplines.

The minor is open to all students, including psychology majors. However, students should note that they are limited to no more than 45 credit hours within a specific department. Students must earn a grade of C or better in at least four of the five courses.

Requirements

In addition to the program requirements listed below, students must:

- take at least nine hours of their minor "core" requirements at UNC–Chapel Hill
- earn a minimum cumulative GPA of 2.000 in the minor core requirements. Some programs may require higher standards for minor or specific courses.

For more information, please consult the degree requirements section of the catalog (http://catalog.unc.edu/undergraduate/degree-requirements/).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>N SCI 175</td>
<td>Introduction to Neuroscience (with a grade of C or better)</td>
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Four courses distributed over at least three academic departments, selected from the following lists:

**Psychology and Neuroscience:**
- NSCI 221 Neuropsychopharmacology
- NSCI 222 Learning $^H$
- NSCI 225 Sensation and Perception $^H$
- Any NSCI course numbered between 300-699 $^1$
- PSYC 245 Psychopathology $^H$
- PSYC 404 Clinical Psychopharmacology
- PSYC 469 Evolution and Development of Biobehavioral Systems
- PSYC 517 Addiction
- PSYC 533 The General Linear Model in Psychology $^H$
- PSYC 559 Applied Machine Learning in Psychology
- PSYC 602 Evolutionary Psychology

**Applied Physical Sciences:**
- APPL 101 Exploring Engineering
- APPL 240 Developing Your Sixth Sense: Designing Sensors and Electrical Circuits to Make Measurements
- APPL 350 Data Science for Applied Science and Engineering
- APPL 430 Optical Instrumentation for Scientists and Engineers
- APPL 435 Nanophotonics

**Biology:**
- BIOL 205 Cellular and Developmental Biology $^H$
- BIOL 224H The Mathematics of Life
- & BIOL 224L and The Mathematics of Life Laboratory
- BIOL 226 Mathematical Methods for Quantitative Biology
- & 226L and Mathematical Methods for Quantitative Biology Laboratory
- BIOL 425 Human Genetics
- BIOL 431 Biological Physics
- BIOL 450 Neurobiology
- BIOL 451 Comparative Physiology
- BIOL 453 Molecular Control of Metabolism and Metabolic Disease
- BIOL 455 Behavioral Neuroscience
- BIOL 458 Sensory Neurobiology and Behavior
- BIOL 523 Sex Differences in Human Disease
- BIOL 544L Laboratory in Diseases of the Cytoskeleton
- BIOL 545 Exploring Brain, Gut, and Immunity $^H$
- BIOL 547 Synaptic Plasticity: Analysis of Primary Literature
- BIOL 552 Behavioral Endocrinology
- BIOL 553 Mathematical and Computational Models in Biology
- BIOL 554 Introduction to Computational Neuroscience
- BIOL 542 Light Microscopy for the Biological Sciences

**Biomedical Engineering:**
- BMME 207 Biomedical Electronics
- BMME 301 Human Physiology: Electrical Analysis
- BMME 445 Systems Neuroscience
- BMME 550 Medical Imaging I: Ultrasonic, Optical, and Magnetic Resonance Systems

**Chemistry:**
- CHEM 430 Introduction to Biological Chemistry $^H$

**Computer Science:**
- COMP 110 Introduction to Programming and Data Science $^H$
  or COMP 111 Introduction to Scientific Programming
- COMP 210 Data Structures and Analysis
- COMP 211 Systems Fundamentals
- COMP 301 Foundations of Programming
- COMP 311 Computer Organization
- COMP 283 Discrete Structures $^H$
- COMP 555 Bioalgorithms
- COMP 560 Artificial Intelligence
- COMP 562 Introduction to Machine Learning
- COMP 576 Mathematics for Image Computing
- COMP 581 Introduction to Robotics $^H$
- COMP 631 Computer Networks
- COMP 633 Parallel and Distributed Computing
- COMP 651 Computational Geometry
- COMP 665 Images, Graphics, and Vision

**Exercise and Sport Science:**
- EXSS 175 Human Anatomy $^F$
EXSS 276  Human Physiology
EXSS 380  Neuromuscular Control and Learning
EXSS 580  Neumechanics of Human Movement

Mathematics:
MATH 210  Mathematical Tools for Data Science
MATH 233  Calculus of Functions of Several Variables<sup>H,F</sup>
MATH 347  Linear Algebra for Applications
MATH 383  First Course in Differential Equations<sup>H</sup>
MATH 523  Functions of a Complex Variable with Applications
MATH 528  Mathematical Methods for the Physical Sciences I
MATH 529  Mathematical Methods for the Physical Sciences II
MATH 535  Introduction to Probability
MATH 553  Mathematical and Computational Models in Biology
MATH 555  Introduction to Dynamics
MATH 564  Mathematical Modeling in the Life Sciences
MATH 566  Introduction to Numerical Analysis
MATH 577  Linear Algebra
MATH 661  Scientific Computation I
MATH 662  Scientific Computation II
MATH 668  Methods of Applied Mathematics I
MATH 669  Methods of Applied Mathematics II

Physics:
PHYS 133  How Bio Works
PHYS 405  Biological Physics

Statistics and Operations Research:
STOR 215  Foundations of Decision Sciences
STOR 415  Introduction to Optimization
STOR 435  Introduction to Probability
STOR 445  Stochastic Modeling
STOR 455  Methods of Data Analysis
STOR 535  Probability for Data Science
STOR 555  Mathematical Statistics
STOR 556  Time Series Data Analysis
STOR 565  Machine Learning

Total Hours 15

<sup>H</sup> Honors version available. An honors course fulfills the same requirements as the nonhonors version of that course. Enrollment and GPA restrictions may apply.

<sup>F</sup> FY-Launch class sections may be available. A FY-Launch section fulfills the same requirements as a standard section of that course, but also fulfills the FY-SEMINAR/FY-LAUNCH First-Year Foundations requirement. Students can search for FY-Launch sections in ConnectCarolina using the FY-LAUNCH attribute.

<sup>1</sup> Except NSCI 395, NSCI 493, NSCI 693H, and NSCI 694H

Department Programs

Majors
- Neuroscience Major, B.S. (http://catalog.unc.edu/undergraduate/programs-study/neuroscience-major-bs/)
- Psychology Major, B.A. (http://catalog.unc.edu/undergraduate/programs-study/psychology-major-ba/)
- Psychology Major, B.S. (http://catalog.unc.edu/undergraduate/programs-study/psychology-major-bs/)

Minors
- Cognitive Science Minor (http://catalog.unc.edu/undergraduate/programs-study/cognitive-science-minor/)
- Neuroscience Minor (p. 1)

Graduate Programs
- M.A. in Psychology (http://catalog.unc.edu/graduate/schools-departments/psychology-neuroscience/)
- Ph.D. in Psychology (http://catalog.unc.edu/graduate/schools-departments/psychology-neuroscience/)

Contact Information
Department of Psychology and Neuroscience
Visit Program Website (http://psychology.unc.edu)
Davie Hall, CB# 3270
(919) 843-0174

Chair
Regina M. Carelli
rcarelli@email.unc.edu

Associate Chair
Karen Gil
kgil@email.unc.edu

Director of Undergraduate Studies
Jeannie Loeb
loeb@email.unc.edu

Director of Undergraduate Psychology Advising
Desiree Griffin
dgriffin@email.unc.edu

Director of Neuroscience Curricula
Kelly Giovanello
kgio@email.unc.edu

Director of Undergraduate Neuroscience Advising
Rachel Penton
pentonre@email.unc.edu

Associate Director of Cognitive Science Program
Vicki Chanon
vchanon@email.unc.edu

Student Services Manager
Rachel Mintel
remintel@email.unc.edu

Undergraduate Instructional Program Coordinator
Christopher Coffey
coffee@email.unc.edu