BEHAVIORAL NEUROSCIENCE

DONALD M. O'MALLEY, PHD
Associate Professor, Biology, and Program Director

Office: 134 Mugar Hall
Phone: 617.373.2284
E-mail contact: Donald M. O'Malley, *Associate Professor and Program Director*, d.omalley@neu.edu

The behavioral neuroscience major is an interdepartmental program for undergraduates, with a program director and advisory board made up of the neuroscience faculty of the College of Arts and Sciences. The field of neuroscience focuses on brain mechanisms and how they give rise to behavioral functions in humans and animals. Behavioral neuroscience combines the disciplines of biology and psychology with a strong background in basic physical sciences and mathematics. The goal is to achieve an understanding of anatomy and physiology of nerve cells, chemical transmission, simple neural circuits, and fundamental biological processes such as inheritance and development, and then to see how these biological events give rise to normal and pathological behavior. The primary objective of the neuroscience major is to draw together faculty and students who are interested in this interdisciplinary topic and to provide undergraduates with an education in the field. This major also seeks to prepare students for advancement to graduate programs in the field of neuroscience or to biology or psychology programs with an emphasis in neurobiology. An additional objective of this major is to prepare its students for admission to medical school, although there are additional science courses that should be taken as electives. Finally, the goal of the curriculum is to prepare students for employment in clinical settings or in allied fields such as the biotech industry.

Note: Due to overlap in course content, double majoring in behavioral neuroscience and psychology or behavioral neuroscience and biology is not permitted.

Transferring to the Major

Students must have a minimum cumulative GPA of 2.000 and completion of any three of the following five courses:

BIOL 1101	Principles of Biology 1	4 SH
with BIOL 1102	Lab for BIOL 1101	1 SH
or BIOL 1111	General Biology 1	4 SH
with BIOL 1112	Lab for BIOL 1111	1 SH
BIOL 1103	Principles of Biology 2	4 SH
with BIOL 1104	Lab for BIOL 1103	1 SH
or BIOL 1113	General Biology 2	4 SH
with BIOL 1114	Lab for BIOL 1113	1 SH
CHEM 1211	General Chemistry 1	4 SH
with CHEM 1212	Lab for CHEM 1211	1 SH
CHEM 1214	General Chemistry 2	4 SH
with CHEM 1215	Lab for CHEM 1214	1 SH
PSYC 1101	Foundations of Psychology	4 SH

with a minimum GPA of 2.000 for these courses. Acceptance into the major is based on students' meeting the above criteria and availability of space in the program.

Academic Progression Standards

Same as college standards.

BS in Behavioral Neuroscience

NU CORE REQUIREMENTS

See page 26 for requirement list.

BEHAVIORAL NEUROSCIENCE MAJOR REQUIREMENTS

Survey Courses—Level 1: Introductory

PSYCHOLOGY

Complete the following course:

PSYC 1101	Foundations of Psychology	4 SH

MATHEMATICS

Complete the following two courses:

MATH 1241	Calculus 1	4 SH
or MATH 1251	Calculus and Differential Equations for Biology 1	4 SH
MATH 1242	Calculus 2	4 SH
or MATH 1252	Calculus and Differential Equations for Biology 2	4 SH

SCIENCE

Complete the following four courses with corresponding labs:

BIOLOGY 1

BIOL 1101	Principles of Biology 1	4 SH
with BIOL 1102	Lab for BIOL 1101	1 SH
or BIOL 1111	General Biology 1	4 SH
with BIOL 1112	Lab for BIOL 1111	1 SH

BIOLOGY 2

BIOL 1103	Principles of Biology 2	4 SH
with BIOL 1104	Lab for BIOL 1103	1 SH
or BIOL 1113	General Biology 2	4 SH
with BIOL 1114	Lab for BIOL 1113	1 SH

CHEMISTRY 1

CHEM 1211	General Chemistry 1	4 SH
with CHEM 1212	Lab for CHEM 1211	1 SH

CHEMISTRY 2

CHEM 1214	General Chemistry 2	4 SH
with CHEM 1215	Lab for CHEM 1214	1 SH

Survey Courses—Level 2: Intermediate

PSYCHOLOGY

Complete the following two courses:

PSYC 2320	Statistics in Psychological Research	4 SH
PSYC 3458	Psychobiology	4 SH
or BIOL 3405	Neurobiology	4 SH

SCIENCE

Complete the following three courses with corresponding labs:

BIOL 2301	Genetics and Molecular Biology	4 SH
with BIOL 2302	Lab for BIOL 2301	1 SH
CHEM 2311	Organic Chemistry 1	4 SH
with CHEM 2312	Lab for CHEM 2311	1 SH
CHEM 2313	Organic Chemistry 2	4 SH
with CHEM 2314	Lab for CHEM 2313	1 SH

Advanced Courses—Psychology

ADVANCED PSYCHOLOGY ELECTIVES (AREA A)

Complete one course from the following list:

PSYC 2358	Behavior Therapies	4 SH
PSYC 3400	Personality	4 SH
PSYC 3402	Social Psychology	4 SH
PSYC 3404	Developmental Psychology	4 SH
PSYC 3406	Abnormal Psychology	4 SH
PSYC 3514	Clinical Neuroscience	4 SH

ADVANCED PSYCHOLOGY ELECTIVES (AREA B)

Complete one course from the following list:

PSYC 3450	Learning and Motivation	4 SH
PSYC 3452	Sensation and Perception	4 SH
PSYC 3464	Psychology of Language	4 SH
PSYC 3466	Cognition	4 SH
PSYC 3510	Psychopharmacology	4 SH
PSYC 3512	Neuropsychology	4 SH
PSYC 4520	Language and the Brain	4 SH

Advanced Courses—Biology

ADVANCED BIOLOGY ELECTIVES (AREA A)

Complete one course with corresponding lab from the following list:

BIOL 2319	Regulatory Cell Biology	4 SH
with BIOL 2320	Lab for BIOL 2319	1 SH
BIOL 3407	Molecular Cell Biology	4 SH
BIOL 5551	Principles of Animal Physiology	4 SH
with BIOL 5552	Lab for BIOL 5551	1 SH

ADVANCED BIOLOGY ELECTIVES (AREA B)

Complete one course with corresponding lab from the following list:

BIOL 3403	Animal Behavior	4 SH
BIOL 5545	Neuroethology	4 SH
with BIOL 5546	Lab for BIOL 5545	1 SH
BIOL 5587	Comparative Neurobiology	4 SH

ADVANCED BIOLOGY ELECTIVES (AREA C)

Complete one course with corresponding lab from the following list:

BIOL 2311	Ecology	4 SH
with BIOL 2312	Lab for BIOL 2311	1 SH
BIOL 2315	Invertebrate Zoology	4 SH
with BIOL 2316	Lab for BIOL 2315	1 SH
BIOL 2317	Vertebrate Zoology	4 SH
with BIOL 2318	Lab for BIOL 2317	1 SH
BIOL 2323	Biochemistry	4 SH
with BIOL 2324	Lab for BIOL 2323	1 SH
BIOL 3401	Comparative Vertebrate Anatomy	4 SH
with BIOL 3402	Lab for BIOL 3401	1 SH
BIOL 5503	Marine Invertebrate Zoology	4 SH
with BIOL 5504	Lab for BIOL 5503	1 SH
BIOL 5541	Endocrinology	4 SH
BIOL 5543	Embryonic Stem Cells	4 SH
BIOL 5547	Sociobiology	4 SH
BIOL 5549	Microbial Biotechnology	4 SH
BIOL 5565	Mammalogy	4 SH
with BIOL 5566	Lab for BIOL 5565	1 SH
BIOL 5573	Medical Microbiology	4 SH
with BIOL 5574	Lab for BIOL 5573	1 SH
BIOL 5577	Developmental Biology	4 SH
with BIOL 5578	Lab for BIOL 5577	1 SH
BIOL 5581	Biological Imaging	4 SH
BIOL 5583	Immunology	4 SH
BIOL 5585	Evolution	5 SH
with BIOL 5586	Lab for BIOL 5585	1 SH

Note: The following courses require permission prior to registration:

PT 5131	Gross Anatomy	4 SH
with PT 5132	Lab for PT 5131	1 SH
PT 5138	Neuroscience	4 SH

Specialty Courses

SEMINAR

Complete one seminar from the following list:

BIOL 3409	Current Topics in Biology	4 SH
BIOL 7383	Topics in Biochemistry Cell and Molecular Biology	2 SH
BIOL 7384	Topics in Integrative Biology	2 SH
PSYC 4650	Seminar in Clinical Case Study	4 SH
PSYC 4652	Seminar in Ethics in Psychology	4 SH
PSYC 4654	Seminar in Behavioral Modification	4 SH
PSYC 4656	Seminar in Psychobiology	4 SH
PSYC 4658	Seminar in Psycholinguistics	4 SH
PSYC 4660	Seminar in Cognition	4 SH
PSYC 4666	Seminar in Clinical Psychology	4 SH
PSYC 4668	Seminar in Sensation and Perception	4 SH
PSYC 4670	Seminar in Research Psychology	4 SH
PSYC 4672	Seminar in History and Theories of Psychology	4 SH

LABORATORY COURSE

Complete one laboratory course from the following list:

BIOL 4970	Junior/Senior Honors Project 1	4 SH
BIOL 4971	Junior/Senior Honors Project 2	4 SH
BIOL 4992	Directed Study	4 SH
BIOL 5579	Biochemistry/Molecular Biology Experimental Approaches	5 SH
PSYC 4602	Experiments in Learning and Motivation	4 SH
PSYC 4604	Laboratory in Learning and Motivation	4 SH
PSYC 4606	Laboratory in Psychobiology	4 SH
PSYC 4608	Laboratory in Animal Behavior Research	4 SH
PSYC 4610	Laboratory in Psycholinguistics	4 SH
PSYC 4612	Laboratory in Cognition	4 SH
PSYC 4622	Laboratory in Sensation and Perception	4 SH
PSYC 4970	Junior/Senior Honors Project 1	4 SH
with PSYC 4971	Junior/Senior Honors Project 2	4 SH
PSYC 4992	Directed Study	4 SH

BEHAVIORAL NEUROSCIENCE EXPERIENTIAL EDUCATION REQUIREMENT

Complete one of the following three options:

Option 1: Practical and Reflective Experience

Complete a practical experience and a reflective experience:

PRACTICAL EXPERIENCE

Complete one research co-op, research internship, research-oriented directed study, or study abroad.

REFLECTIVE EXPERIENCE

Complete one of the following capstones, seminars, or directed studies:

BIOL 4701	Biology Capstone	4 SH
BIOL 4996	Experiential Education Directed Study	4 SH
PSYC 4650	Seminar in Clinical Case Study	4 SH
PSYC 4652	Seminar in Ethics in Psychology	4 SH
PSYC 4656	Seminar in Psychobiology	4 SH
PSYC 4993	Independent Study	4 SH
PSYC 4996	Experiential Education Directed Study	4 SH

Option 2: Honors Project

Complete two semesters of a biology or psychology honors project:

BIOL 4970	Junior/Senior Honors Project 1	4 SH
with BIOL 4971	Junior/Senior Honors Project 2	4 SH
PSYC 4970	Junior/Senior Honors Project 1	4 SH
with PSYC 4971	Junior/Senior Honors Project 2	4 SH

Option 3: Directed Study

Complete two semesters of directed study with a final oral presentation or written report. Both semesters must be in the same lab:

BIOL 4992	Directed Study	4 SH
PSYC 4992	Directed Study	4 SH

BEHAVIORAL NEUROSCIENCE MAJOR CREDIT REQUIREMENT

Complete 83 semester hours in the major.

Due to overlap in course content, double majoring in behavioral neuroscience and psychology or behavioral neuroscience and biology is not permitted. Also, there is no minor offered in behavioral neuroscience.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Minimum 2.000 GPA required