

Behavioral Neuroscience Majors Handout

(Revised October 20, 2004)

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Behavioral Neuroscience Program Description (B.S. Degree only)

Behavioral Neuroscience focuses on the biological basis of human behavior. The program combines the disciplines of biology and psychology to appreciate the scope of human behavior and then understand how the behavior of humans and other animals is controlled by physiological systems.

Course work is designed to provide an understanding of nerve cells, chemical neurotransmission, and neural circuits as well as fundamental biological processes such as inheritance, development, and physiology and then to see how these biological mechanisms give rise to normal and pathological behavior. The curriculum includes a strong background in chemistry and mathematics and prepares students for higher degree granting programs in graduate or medical school. In addition, students with a bachelor's degree are qualified for employment in a variety of fields from clinical and basic research to positions in health care or biotechnology.

General Information

125 Nightingale Hall
(617) 373-3076

Program Director:

Professor Denise Jackson
125 Nightingale Hall
(617) 373-3860
D.Jackson@neu.edu

Assistants

Experiential Education

Advisor/Assistant Director

Professor Richard Melloni
125 Nightingale Hall
(617) 373-3043
Melloni@research.neu.edu

Undergraduate NURONS Club

Coordinator:

Professor Don O'Malley
412 Mugar
(617)373-2284
D.OMalley@neu.edu

Cooperative Education

Coordinator:

Michelle Israel
138 Nightingale
(617) 373-3464
M.Israel@neu.edu

Advising Instructions

For answers to **Questions about the BNS Major** that are not addressed in the Behavioral Neuroscience Handbook, career advice, evaluation of progress in the program, advice on your course schedule, etc., please contact Dr. Jackson. Direct questions to D.Jackson@neu.edu or check with the Psychology Department staff (ph# 617-373-3076) for current office hours. If you cannot attend these office hours, please contact Dr. Jackson at ph# 617-373-3860 for an appointment.

Questions regarding **Experiential Education** should be directed to our BNS Experiential Education Advisor/Assistant Director, Dr. Richard Melloni (x3043 or at melloni@research.neu.edu). **Students must submit the enclosed Experiential Education Plan form to Dr. Melloni in their junior year.** This completion is mandatory before initiation of the formal clearance process. BNS clearance will no longer be completed without submission of this approved form to the BNS program director.

Questions regarding **Co-Op** should be referred to the BNS Co-Op Coordinator, Michele Israel (x3464 or at m.israel@neu.edu)

Questions regarding **College Requirements (Core Courses, etc)** should be directed to Jordan Swift at the Deans Office (1ME, x5469 or at j.swift@neu.edu).

How to Register for Classes

Please note that in the advent of computer registration, students are responsible for registering for courses online or via telephone. The only exception is for freshman or external transfer students in their first semester at the university. **It is recommended that students have 1) the Undergraduate Course Offering Semester Booklet and the Undergraduate Catalog for Full Time Day Programs (this book contains course descriptions and lots of other valuable administrative information) before they begin making their schedules. Answers to many of your questions about administrative issues are in this latter book!**

Entry into filled courses is only possible through the instructor teaching such courses so students are referred to these instructors. The BNS Program Director cannot override class cap limits.

Students are encouraged to seek out advice on their course schedules or their performance in the program from BNS advisors but BNS advisors are not available to physically register students for classes beyond complimentary freshman/new transfer orientation registration.

Considerations before enrolling in any course:

It is imperative that you **satisfy any prerequisites** before taking upper level courses so make sure you satisfy this requirement for optimal course performance and anticipate that instructors will drop students that have not satisfied prerequisite requirements for the upper level courses. Course information including prerequisites can be found in the NU Undergraduate Catalogue Full-Time Day Program book. This book is available at the Registrar's Office (120 Hayden or 1ME). Information in this book can be found online at www.neu.edu.

You should complete courses as follows using a top-down approach

Undergraduate Course Numbering System:

001- 099	Basic and non-credit level courses.	Freshmen Status
100- 299	Introductory level courses	Freshmen Status
300- 499	Intermediate level courses.	Sophomore and Middler Status
500- 699	Advanced level courses designed for	Junior and Senior Status
700- 799	Research thesis and capstone courses	Junior and Senior Status
800- 899	Not assigned yet	Junior and Senior Status
900- 999	Special course work areas (independent study, seminar, honors adjuncts, special problems courses, special topics courses)	Junior and Senior Status

BNS Major Requirements: Current as of October 27, 2004

These requirements supersede information on the NU web site or Semester Equivalent Booklet or anything else you have previously come across.

Survey Courses: The following 13 courses are required:

59 Semester Hrs

7 Courses

<u>Level 1: Introductory Courses</u>	<u>SH Course</u>	<u>Old OH Equivalent</u>
1. Introductory Psychology 4SH	PSYU101	PSY1111+1112
2.*Calculus 1 4SH	(MTHU141 OR MTHU151)	MTH1107OR MTH1133
3. *Calculus 2 4SH	(MTHU142 OR MTHU152)	MTH1108 OR MTH1134
4. Biological Principles 1 +Lab 5SH	BIOU101 + Lab BIOU102	BIO1100 OR BIO1103
5. Genetics and Mol Biology +Lab 5SH	BIOU301 +Lab BIOU302	BIO1282+BIO1660
6. General Chemistry 1, Recit, + Lab 5SH	(CHMU211 + CHMU212 + CHMU213)	CHM1111
7. General Chemistry 2, Recit, + Lab 5SH	(CHMU214 + CHMU215 + CHMU216)	CHM1122

NOTE: Labs are required for all science courses that offer labs if you wish to apply credit for these courses to the BNS major. Waivers for Lab courses **WILL NOT** be permitted!!!

Choice permitted where an * is indicated

Level 2: Intermediate Level Courses SH Course Old OH Equivalent

6 Courses

Statistics in Research+Lab 5SH	(PSYU320)	PSY1211+PSY1212
Note: The Statistics lab PSYU321 is no longer offered. It has been incorporated into the content of PSYU320.		
Psychobiology OR Neurobiology course	4SH PSYU458 or BIOU405	PSY1351 or new
Psychopharmacology 4SH	PSYU510	PSY1451
Organic Chemistry 1 + Lab 5SH or 1271	(CHMU311 + CHMU312)	CHM1264 or 1268
Organic Chemistry 2 + Lab 5SH 1272	(CHMU313 + CHMU314)	CHM1265 or or 1269
Reg. Cell Bio OR Animal Physiology 5SH	BIOU319+320 OR BIOU551+552	BIO1355 OR BIOU1677 BIO1655 OR BIO1473
[If both courses are taken, BIOU551 can count as an Advanced Biology elective]		

NOTE: Labs are required for all science courses that offer labs if you wish to apply credit for these courses to the BNS major. Waivers for Lab courses **WILL NOT** be permitted!!!

3 Advanced Psychology Electives. Take only after completing

Introductory Psychology 12 Semester Hours

1 Course

Take One of the Following Area “A” Psychology Courses 4 Semester Hrs

	<u>SH Course</u>	<u>Old QH Equivalent</u>
Social Psychology 4SH	PSYU402	PSY1271
Personality 4SH	PSYU400	PSY1272 or PSY1772
Abnormal Psychology 4 SH	PSYU406	PSY1373
Biological Basis of Mental Illness 4SH	PSYU202	PSY1220
Developmental Psychology 4SH	PSYU404	PSY1241
Behavior Therapies 4SH	PSYU358	PSY1431

2 Courses

Take 2 of the Following Area “B” Psychology Courses: 8 Semester Hrs

	<u>SH Course</u>	<u>Old QH Equivalent</u>
Learning + Motivation 4SH	PSYU450	PSY1231
Sensation + Perception 4SH	PSYU452	PSY1381+1382(8 QH) or PSY1381 or 1382
Cognition 4SH	PSYU466	PSY1364 or 1764
Psychology of Language 4SH	PSYU464	PSY1262
Neuropsychology 4SH	PSYU512	PSY1452
Language + the Brain 4SH	PSYU520	PSY1365

1 Seminar Course. Take after completing 3 years of courses in the major. Check for Prerequisites. 4 Semester Hours

1 Course

Take 1 of the Following Courses:

	<u>SH Course</u>	<u>4 Semester Hrs</u> <u>Old QH Equivalent</u>
Seminar in Behavior Modification 4SH	PSYU654	PSY1632
Seminar in Psychobiology 4SH	PSYU656	PSY1651
Seminar in Linguistics 4SH	PSYU658	PSY1661
Seminar in Cognition 4SH	PSYU660	PSY1662
Seminar in Clinical Psychology 4SH	PSYU666	PSY1672
Seminar in Sensation/Perception 4SH	PSYU668	PSY1681
Current Topics in Biology 4SH	BIOU409	New Course

The following 2 courses are Graduate Seminars and are worth 2 SH each. Prerequisites include a 3.0 GPA. Both courses will be needed to fulfill the 4 SH worth of credit to satisfy the BNS seminar requirement:

Adv. Topics Biochem. Cell, + Mol. Bio <u>2SH</u>	BIOG383	New Course
Adv. Topics in Integrative Biology <u>2SH</u>	BIOG384	New Course

Note

1 Laboratory Course. Take after completing 2 years of courses in the major. Check for Prerequisites. 4 Semester Hours

1 Course

Take 1 of the Following Courses:

	<u>SH Course</u>	<u>4 Semester Hrs</u> <u>Old QH Equivalent</u>
Expts in Learning + Motivation 4SH	PSYU602	PSY1530
Lab in Learning + Motivation 4SH	PSYU604	PSY1531
Lab in Psychobiology 4SH	PSYU606	PSY1551
Animal Behavior Research 4SH	PSYU608	PSY1553
Lab in Psycholinguistics 4SH	PSYU610	PSY1562
Lab in Cognition 4SH	PSYU612	PSY1564
Lab in Sensation + Perception 4SH	PSYU622	PSY1581
Biochemistry Methods Lab 5SH	BIOU579	BIO1462
Directed Study 4SH	PSYU924	PSY1890-1894 PSY1812,1770,1771

Directed Study 4SH	BIOU924	BIO1381, BIO1492 BIOU1794
Junior/Seniors Honors Project 4SH	PSYU970 and PSYU971	PSY1895-1896
Junior/Seniors Honors Project 4SH	BIOU970, BIOU971	BIO1495+1496

2 Advanced Biology Electives. Check for Prerequisites.

8-10 Semester Hours

2 Courses

NOTE: Labs are required for all science courses that offer labs if you wish to apply credit for these courses to the BNS major. Waivers for Lab courses **WILL NOT** be permitted!!!

Take 2 of the Following Courses:

	<u>SH Course</u>	<u>8-10 Semester Hrs Old QH Equivalent</u>
Ecology + Lab 5SH	(BIOU311 + 312)	BIO1222+Lab BIO1611 or BIO1212
Invertebrate Zoology + Lab 5SH	(BIOU315 + BIOU316)	New Course
Vertebrate Zoology + Lab 5SH	(BIOU317 + BIOU318)	BIO1343+LAB BIO1641
Biochemistry + Lab 5SH BIO1283+LabBIO1661 or	(BIOU323 + BIOU324)	BIO1281 or BIO1461
Comparative Vertebrate Anatomy + Lab 5SH	(BIOU401 + BIOU402)	BIO1356+Lab BIO1656 OR BIO1351
Animal Behavior 4SH	BIOU403	New Course
Molecular Cellular Biology 4SH	BIOU407	BIO1463
Marine Invertebrate Zoology +Lab 5SH	(BIOU503 + BIOU504)	BIO1373+LabBIO1673 or BIO1370
Neuroethology + Lab 5SH	(BIOU545 + BIOU546)	BIO1457 or BIO1474+ Lab BIO1674
Sociobiology + Lab 4SH	BIOU547	New Course
Microbial Biotechnology 4SH	BIOU549	New Course
Biol.of Muscle: Molecules to Movement 4SH	BIOU553	New Course
Mammology + Lab 5SH	(BIOU565 + BIOU566)	BIO1468+Lab1668
Developmental Biology + Lab 5SH	(BIOU577 + BIOU578)	BIO1346+ Lab BIO1646 or BIO1347
Immunology 4SH	BIOU583	BIO1450
Evolution +Lab 4 SH	(BIOU585 + BIOU586)	BIO1321 + BIO 1621 or BIO 1311

Comparative Neurobiology 4 SH	BIOU587	BIO1452
Biological Imaging 4SH	BIOU581	BIO1464
Clinical Gross Anatomy 5SH	PTH U301 + PTH U302	[requires permission of instructor]
Principles of Animal Physiology 5SH	(BIOU551+552)	
[note: BioU551 only counts as Adv. Elective if Reg. Cell Biology was taken to satisfy Level 2 requirement]		
Neurosci. for Phys. Therapy 4SH	PTH U308	[requires permission of instructor]

ℓ **Experiential Education Requirement: 4-8 Semester Hours**

Complete one of the following alternatives. The choice of the experiential education requirement must be approved by the Experiential Education Advisor by the end of the Junior year of study.

Alternative 1 – Two (2) components

The Practical Component of the experiential education requirement precedes the reflective component of the requirement. The Practical component includes the following experiences: a Research-Oriented Co-op, an Internship, a single research-oriented directed study, or a study abroad experience.

The Reflective Component of Experiential Education Requirement follows the practical component and can be filled by enrollment in one of the following courses: Biology Capstone (BIOU701), Seminar in Psychobiology (PSYU656), Seminar in Clinical Case Study (PSYU650), Seminar in Ethics (PSYU652), Experiential Education Directed Study (PSYU951 or BIO954), Independent Study (PSYU934).

Both the practical and reflective components of this alternative must be completed

_____ and _____

Alternative 2 Two (2) Courses

Students registered for Junior and Seniors Honors project will fulfill the experiential education requirement by registering for both courses and submitting a written report of their research project. This fulfills both the practical and reflective component of the experiential education requirement.

Junior/Seniors Honors Project 4SH	PSYU970 + PSYU971	PSY1895 +1896
Junior/Seniors Honors Project 4SH	BIOU970 + BIOU971	BIO1495+1496

_____ and _____

Alternative 3 - Two (2) Courses

Students that complete two (2) or more Directed Studies in the same research laboratory will fulfill the experiential education requirement provided they submit a written report of their research project to both their Directed Study advisor and the Experiential Education advisor. This fulfills both the practical and reflective component of the experiential education requirement.

Directed Study 4SH	PSYU924
Directed Study 4SH	BIOU924

_____ and _____

Return the form on the next page to Dr. Melloni (*125 Nightingale) by your junior year! You will be contacted with an outcome of your proposal.

**BEHAVIORAL NEUROSCIENCE STUDENT'S PLAN FOR COMPLETION OF
EXPERIENTIAL EDUCATION REQUIREMENT**

Submit completed form to Professor Melloni (125 Nightingale Hall) by the start of your junior year. You will receive feedback as to the outcome of your proposal.

Student Name: _____ Student ID # _____

Today's Date: _____ # Years Completed at NU: _____ # Years in BNS Program: _____

Graduation Year: _____

E-Mail Address: _____

Local Mailing Address: _____

Permanent Mailing Address: _____

Please state which alternative you will use to fulfill your experiential education requirement (#1,#2, or #3-See Behavioral. Neuroscience Program Handout for details): _____

Practical Research Experiences (directed studies, co-ops, study abroads, work studies, internships, etc.). For each practical experience list 1) supervisor name, 2) a brief description of your activity, and 3) length of time activity lasted along with initiation and completion dates):

Reflective Experiences: Translates into a major written or oral submission that must be approved by a faculty member. State how you plan to fulfill the reflective component of the experiential education requirement. Note, unless you are taking a course (capstone, psychobiology seminar, or ethics course), you will need to find a faculty member that agrees to serve in this regard and then register for a directed . This is not something that faculty members can readily agree to due to time constraints. Such requests should be made at least a semester prior to the reflection. You are well advised to register for a formal course in order to avoid this problem.

Date _____ Approval Granted____ Approval Denied_____

Experiential Education Advisor Signature: _____

Richard Melloni, Ph.D.

Core Courses

20 Semester Hrs

5 Courses from appropriate categories

BNS majors will complete the following to satisfy the Core:

BNS Core Curriculum:

- 1) 4SH English (ENGU111)
- 2) 4SH English Intensive Writing course - Take Advanced Writing in the Disciplines (ENGU301) OR Advanced Writing in the Health Professions (ENGU306)
- 3) 4SH One Historical, Ethical., and Aesthetics Perspectives course
- 4) 4SH One Methods of Inquiry-Arts/Humanities course
- 5) 4SH One Diversity course
- 6) *8SH Math (Calculus I and II)
- 7) *5SH BIOU301+BIOU302 lab (Genetics) will be used as an Analysis Core requirement
- 8) *4SH PSYU101 (Intro Psych) will be used as a Methods of Inquiry -Social World Context course

* Designates courses that will count for both the BNS major and the Core Curriculum (17 total SH)

*There are 8 courses listed above (32SH), but of the 8 courses, 3 courses (13 SH) are also BNS major requirements. Therefore, there are really only 5 core courses that BNS students will take
TOTAL= 32 SH-12SH double-counted courses=20SH*

Core Categories: 1) Language and Math 2) Methods of Inquiry 3) Diversity 4) Historical, Ethical, and Aesthetic Perspectives and 5) Analysis

Additional information on the core requirements can be obtained from advisors in the Dean's office. BNS advisors do not advise on the core curriculum!

Free Electives

Minimum of 16 Semester Hrs

4 Courses

Take enough free electives so you will complete 128-132 SH required for graduation

Information on Semester Conversion for Behavioral Neuroscience Majors

(Note – General information on Semester Conversion can be found on the website www.neu.edu)

|| Summation of Semester Hours Required for Graduation (BNS majors only)

Year 2004	Number of courses	
60 SH	13 Requisite Courses for the BNS Major	
12 SH	3 Psychology Elective Courses	
8 SH	2 = 1 Laboratory and 1 Seminar Course	
8-10 SH	2 Advanced Bio Electives	
4-8 SH	1 or 2 Experiential Education Courses (Practical and Reflective Components)	
20 SH	5 Core Curriculum Courses	
16 SH	4 Free Electives	
128-134 SH	30-31 Courses	TOTAL

Course Load for BNS Majors

Full time course load is 4 courses, thus the degree can be completed in 4 years at a rate of 8 courses per year. Completion time may vary with co-ops.

Average course load during Fall and Spring is 4 courses

Average course load during summer sessions in 2 courses

|| Number of Courses Required for Graduation

The number of semester hours (SH) required for graduation are contingent upon your year of graduation as follows:

<u>Graduation Year</u>	<u># SH</u>
2004	128
2005	132
2006	132
2007	132
2008+	128

|| Junior Clearance Information

Complete your junior clearance when you accumulate 82-105SH (equivalent of 112-143QH).

Clearance Steps:

1. Have your Experiential Education Plan form approved by Dr. Melloni. Bring a signed copy of this form to you BNS clearance meeting.
2. Make an appointment with your BNS major advisor to determine how many courses you have remaining to be completed to fulfill you BNS major requirements. Your BNS advisor will send a clearance report of these findings to the Deans office and give you a copy of the report. BNS major advisors **do not** advise on Core Requirements!!!
3. Make an appointment with your Dean's office advisor after your BNS advisor has forwarded a copy of your report to the Dean's office. Allow a 10 day window between meetings. The Dean's office advisor, Jordan Swift, will assess the number of non-major requirements you have remaining to complete for graduation. The Dean's office advisor **does not** advise on BNS major requirements!
4. Make an appointment to see a Financial Aid officer if appropriate.

Instructions to take courses off campus and receive BNS substitution credit while you are a Northeastern undergraduate student.

1. Choose courses that are of equivalent credit hours as the NU courses you are requested substitutions for.
2. Courses must be of comparable content to courses for which substitutions are sought
3. Students must stipulate specific NU courses for which they are seeking substitutions and provide the following information for the non NU course:
 - a. Course name, number of hours, and institution where course will be taken
 - b. Course level (number)
 - c. Course description
 - d. Course syllabus or copy of textbook's table of contents
 - e. Approval from an NU instructor that teaches the course you are requesting substitution for. The student needs to submit items a-d to an instructor and request an evaluation. They must ask the instructor to contact the BNS program director with a decision of the instructor's course analysis. The instructor should contact the BNS program director via e-mail or by correspondence on university letterhead in a signed envelope that the student will deliver with the other items (a-d).

Return evaluation outcome (yes or no) to

Mailing address: Denise Jackson, Ph.D., 125 NI, Psychology Dept.

E-mail address: D. Jackson@neu.edu

Items a-c must be derived from verifiable sources (copies from college web site pages with address provided, copies of pages from college catalogues). This information should be submitted to the program director with a petition. Follow the general instructions below

General Instructions applicable for BNS courses, free electives, and core courses:

1. You must petition in advance to take course at another college or university (this includes Northeastern's evening school, the School of Professional and Continuing Studies).
2. The credits must be transferred to Northeastern for credit to be awarded.
3. Official transcripts must be provided to the College of Experiential Education and Academic Advising (CEA)

Note: this procedure differs from transfer credit approval before you are an NU student. See the Undergraduate Catalog and/or the Guidebook for additional information

Instructions for Transferring in to the Behavioral Neuroscience Program

1. Complete any 3 of the following 5 courses:
 Biological Principles 1 (BIOU101) or General Biology 1 (BIOU111)
 Biological Principles 2 (BIOU103) or General Biology 2 (BIOU113)
 Introductory Psychology (PSYU101)
 General Chemistry 1 (CHMU211)
 General Chemistry 2 (CHMU214)
2. Have a minimum cumulative grade point average of a 2.0. at the time of the transfer request.
3. Complete Part 1 of an Arts and Sciences College Petition (forms located at 1 ME).
4. Submit this form to Professor Denise Jackson's mailbox (125 NI). Make sure the pink copy is completely legible so you can be contacted regarding the status of your application!!!
5. You will be contacted to pick up your petition from 125 NI and to return it to the Dean's Office (1 ME) if the Program Director approves your transfer request.
6. Make sure you have the current version of the Behavioral Neuroscience Handbook (dated Oct 30, 2003 or later) and are following these course completion instructions. These guides can be obtained from 125 NI or via an e-mail request to D.Jackson@neu.edu.

NOTE: Acceptance into the BNS major will be based on students meeting the above criteria and on availability of space in the program. Students unable to maintain a minimum 2.0 average will not be allowed to remain in the program.