

SBS College Curriculum Committee
226 University Hall
Columbus, OH 43210

Dear Members of the Curriculum Committee:

As you know, the Neuroscience Undergraduate Program has asked the Committee to consider a series of changes to the structure of the program's minor. We hope that this document, framed in a question/answer format, will serve to explain and justify our proposal, as well as to anticipate any concerns the Committee may have.

Why are we proposing a change to the program's minor? Since inception, two short years ago, the neuroscience program not only has seen incredible growth in the number of majors, but also in the growth of courses being developed. As of the writing of this letter, the program has added an additional 27% (8) more courses to its membership and an additional 16% (6) more courses slated for development during the 2015 calendar year. Due to this abundant growth in the curriculum the minor, which was developed nearly 10 years ago, has fallen out of alignment with the rest of the undergraduate program. Confident in the Program's substantial growth, the Program must also ensure its vitality, its quality, its focus on student success, and realign the minor with the rest of the program.

What are the criteria that we are proposing? We are therefore proposing a change to the Neuroscience Undergraduate minor requirements with the following criteria:

1. The minor will now boast 4 options for students: A General Neuroscience minor, a Molecular/Cellular specialization, a Systems/Behavioral specialization, and a Cognitive/Computational speciation.
 - a. **General Neuroscience Minor**
 - i. This minor will consist of only 12 semesters hours in total (4 classes), which is smaller than the current 15 semester hour version (5 classes).
 - ii. This general minor will consist of our four core courses that stem from the major's requirements.
 1. Neurosc 3000 (Introduction to Molecular/Cellular Neuroscience)
 2. Psych 3313 (Introduction to Behavioral Neuroscience)
 3. Psych 3513 (Introduction to Cognitive Neuroscience)
 4. Neurosc 3050 (Structure & Function of the Nervous System)
 - iii. In the estimation of the faculty, these four courses represent the fundamental knowledge upon which subsequent neuroscience coursework is based, and these courses in concert would constitute a well-structured general minor.

b. Specialized Neuroscience Minors

- i. The neuroscience minors with specializations will consist of 15 semester hours (5 courses) of coursework which stem from two specific categories: Core Requirements and Specialization Requirements. These 15 semester hours will be comprised of three Core Requirements and two Specialization Requirements. These requirements will be:

1. *The Molecular/Cellular Neuroscience Minor specialization*

- a. Core Requirements (students will take all three courses)
- i. Neurosc 3000 (Intro to Molecular/Cellular Neuroscience)
 - ii. Psych 3313 (Intro to Behavioral Neuroscience)
 - iii. Neurosc 3050 (Structure & Function of the Nervous System)
- b. Specialization Requirements (students will choose two of the courses listed on the corresponding major's specialization courses. Students will pick 2 of 9 different courses)

The specialization courses are listed below:

- i. Neurosc 3010 (Neurophysiology)
- ii. Neurosc 4050 (Neurogenetics)
- iii. Neurosc 4100 (Basic/Clinical Foundations of Disease)
- iv. Neurosc 4640 (Neuronal Signal Transduction)
- v. Neurosc 5644 (Behavioral Endocrinology)
- vi. Neurosc 5790H (Developmental Neuroscience)
- vii. Psych 4305 (Intro to Psychopharmacology)
- viii. Psych 4644 (Hormones and Behavior)
- ix. Biochem 4511 (General Biochemistry)

2. *The Systems/Behavioral Neuroscience Minor specialization*

- a. Core Requirements (students will take all three courses)
- i. Neurosc 3000 (Intro to Molecular/Cellular Neuroscience)
 - ii. Psych 3313 (Introduction to Behavioral Neuroscience)
 - iii. Neurosc 3050 (Structure & Function of the Nervous System)
- b. Specialization Requirements (students will choose two of the courses listed on the corresponding major's specialization courses. Students will pick 2 of 11 different courses)

The specialization courses are listed below:

- i. Psych 4305 (Intro to Psychopharmacology)
- ii. Psych 4501 (Advanced Behavioral Neuroscience)
- iii. Psych 5613H (Biological Psychiatry)
- iv. Psych 4644 (Hormones and Behavior)
- v. Psych 5600 (Psychobiology of Learning and Memory)
- vi. Psych 5602 (Behavioral Genetics)
- vii. Psych 5898 (Seminar in Behavioral Neuroscience)

- viii. EEOB 4550 (Neurobiology of Behavior)
- ix. Neurosc 4100 (Basic/Clinical Foundations of Disease)
- x. Neurosc 4623 (Biological Clocks and Behavior)
- xi. Biochem 4511 (General Biochemistry)

3. *The Cognitive/Computational Neuroscience Minor specialization*

- a. Core Requirements (students will take all three courses)
 - i. Neurosc 3000 (Intro to Molecular/Cellular Neuroscience)
 - ii. Psych 3513 (Intro to Cognitive Neuroscience)
 - iii. Neurosc 3050 (Structure & Function of the Nervous System)
- b. Specialization Requirements (students will choose two of the courses listed on the corresponding major's specialization courses. Students will pick 2 of 10 different courses.

The specialization courses are listed below:

- i. Psych 3310 (Sensation and Perception)
- ii. Psych 5600 (Psychobiology of Learning and Memory)
- iii. Psych 5606 (High Level Vision)
- iv. Psych 5614 (Cognitive Neuroscience)
- v. Psych 5614 (Intro to Computational Cognitive Neuroscience)
- vi. Psych 5614 (Intro to Computational Cognitive Neuroscience)
- vii. Psych 5608 (Intro to Mathematical Psychology)
- viii. Psych 5609 (Intro to Mathematical Models in Experimental)
- ix. SHS 5760 (Neurology of Speech & Hearing Mechanisms)
- x. Math 4350 (Quantitative Neuroscience)

What rationale did we use in determining the minors' criteria? The primary goal of this proposal is to ensure that the program is unified in mission, and that our students obtain a strong educational background in neuroscience. The program was designed to be interdisciplinary and rigorous, and we are confident that the proposed changes to the outmoded minor will allow our students to monopolize on the growth that the program has experienced.

How does this minor differ in prerequisites from the previous version?

In general the minor, as proposed above, has a lower credit hour version (the General Neuroscience Minor) than the currently establish minor. Moreover, the proposed specialization minors are the exact same credit hours as the establish minor; however these options will generate more opportunities for our students and these students can utilize the College of Arts & Sciences' overlap policy and all related rules found at

(<http://asccas.osu.edu/sites/asccas.osu.edu/files/Faculty%20rules%20for%20ASC%20degrees-%20FINAL.pdf>). Since the Neuroscience Undergraduate Program is a biological science program, we assume that all students wanting to pursue a minor in neuroscience will have completed at least Biology 1113; while we have retained these hours in our overall Credit Hour Explanation.

General Neuroscience Minor

General Neuroscience Minor: Credit Hour Explanation			
Program credit hour requirements		C) Number of credit hours required for proposed General Minor	D) Change in credit hours from previous version of the minor
Total minimum credit hours required for completion of program		12	-3
Required credit hours offered by the unit	Minimum	0	0
	Maximum	0	0
Required credit hours offered outside of the	Minimum	0	0
	Maximum	0	0
Required prerequisite credit hours not	Minimum	12 ^a	0
	Maximum	12 ^b	-23 ^c
^a Core prerequisites: Chemistry 1110 or 1210 (5 hours); Biology 1113 (4 hours); Psychology 1100 (3hours)			
^b Maximum required prerequisites for specific coursework in the newly proposed minor			
^c The Change in the maximum required prerequisites for coursework in the newly proposed minor. Formula: Maximum required prerequisites for newly proposed minor <u>minus</u> the maximum required prerequisites in the original minor.			

Specialized Neuroscience Minors

Specialized Neuroscience Minor: Credit Hour Explanation					
Program credit hour requirements		C) Number of credit hours required for proposed Molecular/Cellular Minor	D) Number of credit hours required for proposed Systems/Behavioral Minor	E) Number of credit hours required for proposed Cognitive-Computational Minor	F) Change (Δ) in credit hours from previous version of minor
Total minimum credit hours required for completion of program		15	15	15	0
Required credit hours offered by the unit	Minimum	0	0	0	0
	Maximum	0	0	0	0
Required credit hours offered outside of the unit	Minimum	0	0	0	0
	Maximum	0	0	0	0
Required prerequisite credit hours not included above	Minimum	12 ^a	12 ^a	12 ^a	0
	Maximum	21 ^b	21 ^b	23 ^c	-14 ^d , -14 ^d , -12 ^d
^a Minimum minor prerequisites: Chemistry 1110 or 1210 (5 hours); Biology 1113 (4 hours); Psychology 1100 (3hours)					
^b Maximum required prerequisites for specific coursework in the newly proposed minor--stemming from BioChem 4511 prerequisites					
^c Maximum required prerequisites for specific coursework in the newly proposed minor--stemming from the combination of Math 4350 and Psych 5608 prerequisites					
^d The Change in the maximum required prerequisites for coursework in the newly proposed minor. Formula: Maximum required prerequisites for newly proposed minor <u>minus</u> the maximum required prerequisites in the original minor.					

How will this change affect the student body? We believe that the changes proposed above will greatly enhance our student's knowledge of neuroscience, and will create a stronger foundation in which students will be able to better utilize their knowledge. However, these changes will have different implications for various types of students. Our analysis has identified three distinct student groups: (1) already declared minors; (2) students who contacted us recently inquiring about pursuing

the minor; and (3) other currently enrolled students at the university. Each of these groups may enter the minor program according to differing sets of parameters.

Already Declared Minor:

Students who declared the Neuroscience minor before Spring Semester 2015 will be exempt from the changes being proposed in this document. All previous versions of the minor will be honored unless the student has been separated from the university for four year. All current minor students will also have the opportunity to switch to the new version of the minor if they so please. An email will be sent to all declared minor student explaining their rights and choices.

Students Who Contacted Us Recently Inquiring About Pursing the Minor:

The program will contact all students from the past two terms that have made appointments to discuss the possibility of pursuing the minor. We will give these students until the end of the SP15 term to declare the previous minor. Additionally, a narrative is already on the website warning of the up-and-coming changes to better inform students. This will give these students the opportunity to declare the current minor before implementation of this new version. Finally, academic advisors at the university will be notified of the change to aid in informing as many students as possible.

Other Currently Enrolled Students at the University:

In order to reach many students as possible to inform them of this proposed change, academic advisors at the university will be notified of the change. In addition, as stated previously above, a narrative is already on the website warning of the up-and-coming changes to help student understand the possible changes that are coming to the minor—giving them an opportunity to declare the current version before implementation of this new version.

How will the program handle appeals? Any student appeals or petitions regarding the above will be considered by the Neuroscience Undergraduate Studies Committee.

Sincerely,



Dr. John P. Bruno
Director of the Neuroscience Major
Professor of Psychology, Neuroscience, and Psychiatry



Dr. Charlie Campbell
Associate Director- Student Services, Neuroscience Major
614-292-7379; campbell.601@osu.edu

The Ohio State University
College of Arts and Sciences

Neuroscience Minors (NEURO-MN)

Neuroscience Undergraduate Program
10 Townshend Hall, 1885 Neil Avenue
Columbus, OH 43210 Tel: (614) 292-8512
NeuroscienceMajor.osu.edu

In order to declare a minor in Neuroscience, you must complete the online minor orientation video, and then meet with an advisor in the Neuroscience Undergraduate Program.

Neuroscience is a scientific discipline that investigates the organization, development, and function of the nervous system, and its relationship to behavior, cognition, and neurological/neuropsychiatric disorders. The Neuroscience program offers a 12 hour general neuroscience minor as well as three 15 hour specialization minors. These minors provide a focus of study in a specific area of neuroscience.

General Neuroscience Minor

The general Neuroscience minor is a 12 credit hour minor consisting of the four core foundational courses in the Neuroscience program. This minor will give students the foundational knowledge of what neuroscience is as a discipline.

Core requirements (Take all 4 courses):

Neuro 3000 Introduction to Molecular/Cellular Neuroscience
Psych 3313 Introduction to Behavioral Neuroscience
Neuro 3050 Structure & Function of the Nervous System
Psych 3513 Introduction to Cognitive Neuroscience

Molecular/Cellular Neuroscience Minor

Molecular/Cellular Neuroscience examines the mechanisms related to the basic biological processes of neurons and support cells of the nervous system. Molecular/Cellular neuroscientists tend to study how neurons communicate, how parts of neurons function, and explore the anatomy and physiology of neurons.

Core Requirements (Take all 3 courses):
Psych 3313, Neuro 3000, Neuro 3050

Elective Requirements (Take any 2 courses):
Neuro 3010, Neuro 4050, Neuro 4100, Neuro 4640,
Neuro 5790H, Biochem 4511, Psych 4305, Neuro 4623,
Psych 4501, Psych 5613H, Psych 4644

Systems/Behavioral Neuroscience Minor

Systems/Behavioral Neuroscience studies how neurons work together in networks to understand the mechanisms that underlie behavior. Systems/Behavioral neuroscientists tend to study how the nervous system is related to psychiatric and neurological disorders, how groups of neurons form systems that are related to specified functions, and what happens when such systems dysfunction.

Core Requirements (Take all 3 courses):
Psych 3313, Neuro 3000, Neuro 3050

Elective Requirements (Take any 2 courses):
Psych 4305, Psych 4501, Psych 4644, Psych 5600,
Psych 5602 Neuro 4100, Neuro 4623, Biochem 4511,
Psych 5613H, Psych 5898, EEOB 4550

Cognitive/Computational Neuroscience Minor

Cognitive/Computational Neuroscience studies the neural mechanisms that underlie mental processes. Cognitive/Computational neuroscientists tend to study how specific areas of the brain are related to thought and sensory processing, create mathematical models to understand cognitive processes, and may conduct research in the area of artificial intelligence.

Core Requirements (Take all 3 courses):
Psych 3513, Neuro 3000, Neuro 3050

Elective Requirements (Take any 2 courses):
Psych 3310, Psych 5600, Psych 5606, Psych 5614,
SHS 5760, Math 4350, Psych 5608, Psych 5609

Neuroscience Research:

We will count one neuroscience research (4998) or internship (3193) experience toward the elective requirement of any of the specialization minors. The student must have 3 semester credit hours of the experience to equal one class toward the minor. Pre-approval by a neuroscience advisor is required.

Neuroscience minor program guidelines

The following guidelines govern minors.

Approval required:

The minor program must be approved by an advisor in the Neuroscience Undergraduate Program and filed with the Neuroscience Advising Office.

Required for graduation

No

Classes/Credit hours required

5 classes/15 minimum hours

Transfer courses allowed

A maximum of 1 class/3 semester hours

Overlap with the GE

No more than 6 hours can overlap between GE and a minor.

Overlap with a major or minor

- General Minor: Not Permitted
- Specialization Minors: 1 course may overlap between a minor or major
- The minor must be in a different subject than the major..

Grades required:

- Minimum C- for a course to be listed on the minor.
- Minimum 2.00 overall GPA is required for the minor.
- Pass/Non-Pass courses cannot count on the minor

Filing the minor program form:

The minor program form must be filed at least by the time the graduation application is submitted to a major advisor.

Changing the minor:

Once the minor program is filed in the College Office, any changes must be approved by a Neuroscience undergraduate advisor.

College of Arts and Sciences
Curriculum and Assessment Services
154 Denney Hall, 164 W. 17th Ave.
<http://artsandsciences.osu.edu>

Received 6/22/12 DH