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 years ago, the Neuroscience Undergraduate Program not only has seen incredible growth in the number of students in the major, but also in the amount of courses being developed. As of the writing of this letter, the program has added 27% (8) more courses to its membership, and an additional 16% (6) more courses are 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 progress, the Program must also ensure its vitality, its quality, its focus on student success, and, therefore, must 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 Neuroscience Undergraduate Program proposes the creation of 4 neuroscience minors: General Neuroscience Minor, Molecular/Cellular Neuroscience Minor, Behavioral/Systems Neuroscience Minor, and the Cognitive/Computational Neuroscience Minor.
	1. **General Neuroscience Minor**
		1. This minor will consist of only 12 semester hours in total (4 classes), which is smaller than the current 15 semester hour version (5 classes).
		2. This general minor will consist of our four core courses that stem from the major’s requirements.
			1. Neuro 3000 (Introduction to Molecular/Cellular Neuroscience)
			2. Psych 3313 (Introduction to Behavioral Neuroscience)
			3. Psych 3513 (Introduction to Cognitive Neuroscience)
			4. Neuro 3050 (Structure & Function of the Nervous System)
		3. 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.
	2. **Molecular/Cellular Neuroscience Minor**
		1. The Molecular/Cellular Neuroscience Minor 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*
				1. Core Requirements (students will take all three courses)

Neuro 3000 (Intro to Molecular/Cellular Neuroscience)

Psych 3313 (Intro to Behavioral Neuroscience)

Neuro 3050 (Structure & Function of the Nervous System)

* + - * 1. Specialization Requirements (students will choose two of nine courses listed on the corresponding major’s specialization courses. Students will pick 2 of 10 different courses). The specialization courses are listed below:

Neuro 3010 (Neurophysiology)

Neuro 4050 (Neurogenetics)

Neuro 4100 (Basic/Clinical Foundations of Disease)

Neuro 4640 (Neuronal Signal Transduction)

Neuro 5790H (Developmental Neuroscience)

Psych 4501 (Advanced Behavioral Neuroscience)

Psych 4305 (Intro to Psychopharmacology)

Psych 4644 (Hormones and Behavior)

Psych 5613H (Biological Psychiatry)

Biochem 4511 (Introduction to Biochemistry)

* 1. **Behavioral/Systems Neuroscience Minor**
		1. The Behavioral/Systems Neuroscience Minor 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 Behavioral/Systems Neuroscience Minor
				1. Core Requirements (students will take all three courses)

Neuro 3000 (Intro to Molecular/Cellular Neuroscience)

Psych 3313 (Introduction to Behavioral Neuroscience)

Neuro 3050 (Structure & Function of the Nervous System)

* + - * 1. Specialization Requirements (students will choose two of eleven courses listed on the corresponding major’s specialization courses. Students will pick 2 of 11 different courses). The specialization courses are listed below:

EEOB 4550 (Neurobiology of Behavior)

Neuro 4100 (Basic/Clinical Foundations of Disease)

Neuro 4623 (Biological Clocks and Behavior)

Psych 4305 (Intro to Psychopharmacology)

Psych 4501 (Advanced Behavioral Neuroscience)

Psych 5613H (Biological Psychiatry)

Psych 4644 (Hormones and Behavior)

Psych 5600 (Psychobiology of Learning and Memory)

Psych 5602 (Behavioral Genetics)

Psych 5898 (Seminar in Behavioral Neuroscience)

Biochem 4511 (Introduction to Biochemistry)

* 1. **Cognitive/Computational Neuroscience Minor**
		1. The Cognitive/Computational Neuroscience Minor 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 Cognitive/Computational Neuroscience Minor
				1. Core Requirements (students will take all three courses)

Neuro 3000 (Intro to Molecular/Cellular Neuroscience)

Psych 3513 (Intro to Cognitive Neuroscience)

Neuro 3050 (Structure & Function of the Nervous System)

* + - * 1. 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:

Math 4350 (Quantitative Neuroscience)

Psych 3310 (Sensation and Perception)

Psych 5600 (Psychobiology of Learning and Memory )

Psych 5606 (High Level Vision )

Psych 5608 (Intro to Mathematical Psychology)

Psych 5609 (Intro to Mathematical Models in Experimental)

Psych 5614 (Cognitive Neuroscience)

Psych 5618 (Intro to Computational Cognitive Neuroscience)

SPHHRNG 5760 (Neurology of Speech & Hearing Mechanisms)

**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. Moreover, the proposed specialization minors require the exact same number of credit hours as the established minor with the exception of the general minor, which requires 3 fewer credit hours. In addition, these minor options will generate more choices for our students and have been developed so students can utilize the College of Arts & Sciences’ overlap policy and all related rules found at (<https://asccas.osu.edu/files/ASC_CurrAssess_Operations_Manual.pdf>).

**How does this minor differ in prerequisites from the previous version?**
In general, the four minors do not differ in prerequisite structure when compared to the previous version. The primary prerequisites for these minors, stemming primarily from the Core Requirements of the major, are Psychology 1100 (for Psych 3313/3513), Biology 1113 (for Neuro 3000), and the co-requisite of Chemistry 1110/1210 (for Biology 1113). Students can monopolize on the fact that all three of these prerequisites count toward the College of Arts & Sciences’ GE requirements. More specifically, Psychology 1100 can be used toward the Social Science GE requirement, while the Biology and Chemistry prerequisites can be used toward the Natural Science GE requirement.

**General Neuroscience Minor**



**Specialized Neuroscience Minors**



**How will this change affect the student body?** We believe that the changes proposed above will greatly enhance our students’ 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.

*Current Minors:* 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 years. 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 students explaining their rights and choices.

*Students Who Contacted Us Recently Inquiring About Pursuing the Minor:*The program will contact all students from the past two terms who 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 students 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,


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**The Ohio State University**

**College of Arts and Sciences**

**Neuroscience Minors**

Neuroscience Undergraduate Program

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<http://NeuroscienceMajor.osu.edu>

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 the choice of 4 minors: General Neuroscience Minor, Molecular/Cellular Neuroscience Minor, Behavioral/Systems Neuroscience Minor, and a Cognitive/Computational Neuroscience Minor.

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

*\*\*Prerequisites for all of the minors are: Psych 1100 (for Psych 3313/3513), Biology 1113 (for Neurosc 3000) and Chem 1110 or 1210 (co-requisite for Biology 1113).*

**General Neuroscience Minor**

The General Neuroscience Minor is a 12 credit hour minor consisting of the four core courses. This minor will give students the foundational knowledge in the Neuroscience 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**

The Molecular/Cellular Neuroscience Minor is a 15 credit hour specialized minor consisting of the 3 core courses and 2 specialization courses. This minor 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 the anatomy and physiology of neurons.

*Core Requirements (Take all 3 courses):*

Psych 3313, Neuro 3000, Neuro 3050

*Specialization Requirements (Take any 2 courses):*

Neuro 3010, Neuro 4050, Neuro 4100, Neuro 4640, Neuro 5790H, Biochem 4511, Psych 4305, Psych 4501, Psych 5613H, Psych 4644

**Behavioral/Systems Neuroscience Minor**

The Behavioral/Systems Neuroscience Minor is a 15 credit hour specialized minor consisting of the 3 core courses and 2 specialization courses. This minor examines how neurons work together in networks to understand the mechanisms that underlie behavior. Behavioral/Systems 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 specific 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):*

EEOB 4550, Neurosc 4100, Neurosc 4623, Psych 4305, Psych 4501, Psych 5613H, Psych 4644, Psych 5600, Psych 5602, Psych 5898, Biochem 4511

**Cognitive/Computational Neuroscience Minor**

The Cognitive/Computational Neuroscience Minor is a 15 credit hour specialized minor consisting of the 3 core courses and 2 specialization courses. This minor explores 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):*

Math 4350, Psych 3310, Psych 5600, Psych 5606, Psych 5614, Psych 5608, Psych 5609, Psych 5618, SHS 5760

**Neuroscience minor program guidelines**

The following guidelines govern minors:

Required for graduation

No

Classes/Credit hours required

General Minor: 4 classes/12 minimum hours

Specialized Minors: 5 classes/15 minimum hours

Transfer and EM Credit Hours Allowed:

A maximum of 2 classes (6 semester hours) of transfer credit and/or credit by examination can be used toward the minor

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

• Specialized 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

• No more than three semester credit hours of coursework

 graded Satisfactory/Unsatisfactory may count toward the

 minor.

Approval required:

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

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

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