NEUROSCIENCE, BACHELOR OF SCIENCE (5013)

Program Coordinator
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The subject of neuroscience - the science of nervous system and brain structure and function - is a rapidly-growing science that has become established within many different scientific disciplines. The Neuroscience Major begins with a rigorous core of basic science classes and laboratories, moving on to a core of more advanced classes. All students are educated in the breadth of the subject, but will eventually choose one of three concentrations – systems, behavioral, or computational.

These three concentrations represent natural pipelines to a variety of careers and postgraduate degree options. The Systems concentration can lead to options such as in-depth graduate study in neuroscience or clinical psychopharmacology or a career in the pharmaceutical industry. The Systems concentration may also be supplemented with additional coursework as a pre-health professions option leading to a medical school application. Students in the Behavioral concentration can progress to graduate study in cognitive neuroscience or psychiatry. Those in the Computational concentration could find career options such as artificial intelligence, medical data analytics, healthcare analytics, prosthetics, or robotics. As a strong natural science degree with a large "hands-on" component, the Neuroscience Major educates students to be lifelong innovators and problem-solvers.

- Systems (NSYS)
- Behavioral (NBEH)
- Computational (NCOM)

Program Requirements (64-70 Hours)

The Neuroscience Major begins with a rigorous core of basic science classes and laboratories, moving on to a core of more advanced classes. All students are educated in the breadth of the subject, but will eventually choose one of three concentrations - systems, behavioral, or computational.

Code	Title	Hours
Core Courses		
BIOL 120 & BIOL 121	Biological Concepts: Cells Metabolism and Genetics and Biological Concepts: Cells, Metabolism, and Genetics Lab	4
Take 3 of these 4		11-13
BIOL 122 & BIOL 123	Biological Concepts: Evolution, Diversity, and Ecology and Biological Concepts: Evolution, Diversity, and Ecology Lab	
CHEM 120 & CHEM 121	College Chemistry I and College Chemistry I Laboratory	
PSYS 160 & PSYS 161	Introduction to Biopsychology and Introduction to Biopsychology Laboratory	
CS 170	Problem Solving and Programming	
or PSYS 415	Programming for Social Sciences	
MATH 183	Introductory Statistics	3
or BIOL 382	Introductory Biostatistics	
or PSYS 313	Statistics in Psychology	
PSYS 210 & PSYS 211	Research Methods in Psychology and Research Methods in Psychology Laboratory	4
PSYS 300	Writing in the Psychological Sciences	3
NEUR 175	Neuroscience Seminar 1	1
NEUR 310	Research Techniques of Neuroscience	3
NEUR 401	Cellular and Molecular Neuroscience	3
NEUR 402	Systems Neuroscience	3
NEUR 498	Neuroscience Seminar 2 [1]	2
BIOL 399	Research in the Biological Sciences	1
or CHEM 399	Research Problems in Chemistry	
or PSYS 490	Independent Study in Psychological Sciences	
Total Hours		**38-40**

[1] NEUR 498 will need to be taken twice to fulfill the requirements of Neuroscience.

Systems Concentration (67-70 hours)

Code	Title	Hours
Core Courses		38-40
BIOL 224 & BIOL 225	Animal Biology and Diversity and Animal Biology and Diversity Lab	4
BIOL 319	Introduction to Molecular and Cell Biology	3
BIOL 330	Animal Physiology	3
BIOL 464	Endocrinology	3
CHEM 222 & CHEM 223	College Chemistry II and College Chemistry II Laboratory	5
CHEM 340 & CHEM 341	Organic Chemistry I and Organic Chemistry Laboratory I	5
PSYS 360 & PSYS 365	Behavioral Neuroscience and Laboratory in Behavioral Neuroscience	3-4
or BIOL 335	Neurobiology	
PSYS 465	Psychopharmacology	3
Total Hours		**67-70**

Behavioral Concentration (64-66 hours)

Code	Title	Hours
Core Courses		38-40
BIOL 224 & BIOL 225	Animal Biology and Diversity and Animal Biology and Diversity Lab	4
PSYS 331	Principles of Human and Animal Learning	3
or BIOL 334	Animal Behavior	

PSYS 333	Cognitive Psychology	3
PSYS 360 & PSYS 365	Behavioral Neuroscience and Laboratory in Behavioral Neuroscience	4
PSYS 363	Sensory and Perceptual Systems	3
PSYS 440	Abnormal Psychology	3
PSYS 462	Fundamentals of Cognitive Neuroscience	3
PSYS 465	Psychopharmacology	3
Total Hours		**64-66**

Computational Concentration (64-66 hours)

Code	Title	Hours
Core Courses		38-40
CS 180	Computer Science I	4
CS 290	Computer Science II	4
CS 331	Data Structures	3
CS 339	Discrete Structures	3
CS 456	Artificial Intelligence	3
MATH 307	Introduction to Linear Algebra	3
PSYS 360 or BIOL 335	Behavioral Neuroscience Neurobiology	3
PSYS 333	Cognitive Psychology	3
Total Hours		**64-66**

Required Support Course for Computational Concentration (4 hours)

Code	Title	Hours
MATH 136	Calculus I	4
Total Hours		**4**

Systems Concentration

First Year

Fall	Hours	Spring	Hours
BIOL 120	3	BIOL 122	3
BIOL 121	1	BIOL 123	1
ENG 100	3	CHEM 120	3
MATH 116	3	CHEM 121	2
NEUR 175	1	COMM 145	3
PSYS 160	3	Colonnade F-SB	3
PSYS 161	1		
	15		**15**

Second Year

Fall	Hours	Spring	Hours
MATH 183	3	ENG 200	3
CHEM 222	3	NEUR 310	3
CHEM 223	2	BIOL 224	3
PSYS 210	3	BIOL 225	1
PSYS 211	1	BIOL 319	3
Colonnade E-AH	3	Colonnade E-SB	3
	15		**16**

Third Year

Fall	Hours	Spring	Hours
BIOL 330	3	NEUR 402	3
CHEM 340	3	PSYS 300	3
CHEM 341	2	Colonnade K-SY	3
NEUR 401	3	Elective	3
NEUR 498	1	Elective	3
Colonnade K-LG	3		
	15		**15**

Fourth Year

Fall	Hours	Spring	Hours
BIOL 335	3	Independent Study	1
BIOL 464	3	Elective	3
NEUR 498	1	Elective	3
PSYS 465	3	Elective	3
Colonnade K-SC	3	Elective	3
Elective	3		
	16		**13**

Total Hours 120

Behavioral Concentration

First Year

Fall	Hours	Spring	Hours
BIOL 120	3	BIOL 122	3
BIOL 121	1	BIOL 123	1
ENG 100	3	CHEM 120	3
MATH 116	3	CHEM 121	2
NEUR 175	1	PSYS 100	3
PSYS 160	3	Colonnade F-SB	3
PSYS 161	1		
	15		**15**

Second Year

Fall	Hours	Spring	Hours
BIOL 224	3	COMM 145	3
BIOL 225	1	NEUR 310	3
ENG 200	3	PSYS 313	3
PSYS 210	3	PSYS 333	3
PSYS 211	1	Colonnade E-SB	3
Colonnade E-AH	3		
	14		**15**

Third Year

Fall	Hours	Spring	Hours
NEUR 401	3	NEUR 402	3
NEUR 498	1	PSYS 300	3
PSYS 331	3	PSYS 363	3
PSYS 440	3	Colonnade K-SY	3
Colonnade K-LG	3	Elective	3
Elective	3		
	16		**15**

Fourth Year

Fall	Hours	Spring	Hours
NEUR 498	1	Independent Study	1
PSYS 360	3	PSYS 462	3
PSYS 365	1	Elective	3
PSYS 465	3	Elective	3
Colonnade K-SC	3	Elective	3
Elective	3	Elective	3
	14		**16**

Total Hours 120

Computational Concentration

First Year

Fall	Hours	Spring	Hours
BIOL 120	3	BIOL 122	3
BIOL 121	1	BIOL 123	1
ENG 100	3	COMM 145	3
MATH 116	3	MATH 117	3
PSYS 160	3	Colonnade F-SB	3
PSYS 161	1		
NEUR 175	1		
	15		**13**

Second Year

Fall	Hours	Spring	Hours
CS 180	4	CS 290	4
MATH 136	4	ENG 200	3
PSYS 210	3	MATH 307	3
PSYS 211	1	NEUR 310	3
Colonnade E-AH	3	PSYS 313	3
		PSYS 415	3
	15		**19**

Third Year

Fall	Hours	Spring	Hours
CS 331	3	CS 339	3
NEUR 401	3	NEUR 402	3
NEUR 498	1	PSYS 300	3
PSYS 360	3	Colonnade E-SB	3
Colonnade K-LG	3	Colonnade K-SY	3
Elective	3		
	16		**15**

Fourth Year

Fall	Hours	Spring	Hours
NEUR 498	1	Independent Study	1
CS 456	3	PSYS 333	3
Elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	1
	16		**14**

Total Hours 123