

Neuroscience

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Neuroscience Courses

Program Goals

- To develop critical and interdisciplinary thinking skills.
 - To enhance both oral and written communication and information literacy skills
 - To acquire depth and breadth of knowledge in neuroscience.
 - To gain knowledge of and respect for the varying levels of analysis in neuroscience, and to develop the ability to synthesize information across such levels.
 - To develop an understanding of issues pertinent to ethics in neuroscience, as well as the ambiguity inherent in neuroscience
- To develop knowledge of and experience with a number of research methodologies employed in the field of neuroscience
 - To gain an understanding of future employment and educational opportunities available to individuals majoring in neuroscience.

Objectives

Neuroscience is the scientific study of normal and abnormal development, structure, and function of the nervous system. In addition, Neuroscience seeks to better understand the role of the nervous system in behavior. The Interdisciplinary Program in Neuroscience offers a Bachelor of Science degree with a breadth of coursework across Psychology and the Natural Sciences. Undergraduate research is prominent, and students are encouraged to explore relations between brain and behavior across multiple levels. The curriculum provides students with an academic and experiential background for graduate study in the neurosciences and/or employment in a research setting. The program is designed to offer both breadth of background while allowing a degree of specialization.

Program Requirements

Students must maintain at least a cumulative 2.5 GPA in courses required for the Neuroscience major. Students desiring further specialization are encouraged to pursue a relevant minor in combination with the major. For example, students interested in Theoretical Neuroscience may choose a minor in Mathematics, Physics, or Computer Science. Students interested in Clinical Neuropsychology are encouraged to pursue a minor in Psychology. Pre-Med are strongly advised to complete applicable Chemistry and Biology coursework as needed for medical school acceptance. Consultation with program advisors is crucial in preparing the best pathway for the individual students. Students choosing a double major or minor within the science program or psychology may not apply electives to more than one major or minor.

Only classes listed as required classes for both majors/minors may be applied to both.

Students must meet the college-wide graduation requirements in addition to the Neuroscience major:

- 124 total hours
- 30 upper division hours
- WCore requirements

Neuroscience Major

Requirement Description	Credit Hours	Prerequisites
I. World Language Requirement	8	
Neuroscience majors must complete eight credit hours in a single world language.		
II. Required Core Courses	38	
BIOL 204 Principles of Genetics (4)		CHEM 112
BIOL 205 Intro to Cell Biology (4)		CHEM 112
CHEM 111–112 Principles of Chemistry I and II and Labs (4–4)		CHEM 111 co-requisites: CHEM 111R recommended, MATH 144 required/CHEM 111
DATA 220 Intro to Statistics (4)		
NEURO 205 Introduction to Brain and Behavior (4)		
NEURO 302 Research Methods in Neuroscience (4)		NEURO 205, DATA 220; co-requisite: BIOL 205
NEURO 409 Advanced Topics in Neuroscience (2)		PSYC 105, BIOL 204, NEURO 205, and PSYC 390 or NEURO 302
PSYC 105 Bust That Psychology Myth (4)		
<i>Choose one of the following courses:</i>		
• DATA 350 Statistical Modeling (4)		DATA 220
• MATH 201 Calculus I (4)		MATH 144 or placement test
• WCSAM 203 Linear Algebra (4)		
III. Natural Science and Math Electives	20	
<i>Complete 20 credit hours from the following list of courses. 12 of these hours must be upper division courses.</i>		
Biology		
BIOL 103 Human Anatomy and Lab (4)		
BIOL 104 Human Physiology and Lab (4)		BIOL 103
BIOL 304 Stem Cells and Development and Lab (4)		BIOL 204, 205, CHEM 111, 112
BIOL 350 Biochemistry and Lab (4)		BIOL 205, CHEM 304

BIOL/CHEM/PHYS 370 Scientific Computing (4)	PHYS 211 or PHYS 151 and MATH 201
BIOL 405 Cell Biology of Cancer and Lab (4)	BIOL 204, 205; CHEM 111, 112, 303, 304
<u>Chemistry</u>	
CHEM 303 Organic Chemistry I and Lab (4)	CHEM 112
CHEM 304 Organic Chemistry II and Lab (4)	CHEM 303
<u>Computer Science</u>	
CMPT 201 Introduction to Computer Science (4)	co-requisite: MATH 101
<u>Data Science</u>	
DATA 370 Statistical Learning (4)	DATA 350
<u>Mathematics</u>	
MATH 202 Calculus II (4)	MATH 201 or placement test
MATH 203 Multivariate Calculus (4)	MATH 202
MATH 363 Differential Equations (4) – offered spring	MATH 202
<u>Neuroscience</u>	
NEURO 300 Special Topics in Neuroscience (2–4)	
NEURO 305 Human Brain Development (4) – offered fall of even numbered years	NEURO 205; co-requisite: PSYC 203
NEURO 402 Behavioral Endocrinology (4) – offered spring of odd years	NEURO/PSYC 205 or NEURO/PSYC 390
NEURO 430 Independent Thesis Research (2) (May be taken two semesters for credit)	NEURO 302 or 390
<i>or</i>	
WCSAM 400 Science Capstone (2)	
NEURO 434 Social Neuroscience (4) – offered fall of odd numbered years	NEURO/PSCY 390 or NEURO 302 and PSYC 216 or NEURO/PSYC 205
<u>Physics</u>	
PHYS 151 Principles of Physics I and Lab (4) – offered fall	MATH 144
PHYS 152 Principles of Physics II and Lab (4) – offered spring	PHYS 151 or 211
PHYS 211 Physics for Scientists and Engineers I and Lab (4) – offered fall	MATH 144; co-requisite: MATH 201
PHYS 212 Physics for Scientists and Engineers II and Lab (4) – offered spring	PHYS 211; co-requisite: MATH 202
<u>Psychology</u>	
PSYC 203 Lifespan Development (4)	
PSYC 209 Cognitive Psychology (4)	PSYC 105
PSYC 362 Abnormal Psychology (4)	PSYC 252, PSYC 270

Note: Students may count either PHYS 150- level coursework OR PHYS 200-level coursework as elective credit toward the major, but not both. Students desiring to take additional hours in a particular discipline should consider an academic minor in the pertinent field. Special topics and directed studies hours are limited to a total of 6 credits and must be approved by an academic advisor prior to registration. Additional coursework may be approved for elective credit by an academic advisor if the advisor and student feel that the suggested course is pertinent to the individual student's plan of study and educational goals.

IV. Additional Neuroscience Electives	8	
<i>Neuroscience majors must choose 8 hours of additional neuroscience electives chosen from the following courses:</i>		
NEURO 306 Behavioral Neuroscience and Lab (4)		NEURO 205
NEURO 403 Cellular Neuroscience and Lab (4) – offered spring of odd years		BIOL 204, 205, CHEM 112, and NEURO 302
NEURO 408 Cognitive Neuroscience and Lab (4) – offered fall		PSYC 105, NEURO 205, DATA 220, and NEURO/PSYC 390 or NEURO 302
TOTAL HOURS FOR NEUROSCIENCE MAJOR	74-76	

Recommended Plan of Study

	Fall Semester	Spring Semester
Freshman Year	PSYC 105 or NEURO 205 CHEM 111 Language or WCore	PSYC 105 or NEURO 205 CHEM 112 Language or WCore
Sophomore Year	DATA 220 or MATH 201 BIOL 204 or 205 NEURO 302 Language or WCore	DATA 220 or MATH 201 BIOL 204 or 205 NEURO 302 Language or WCore
Junior Year	Part III and/or Part IV Elective(s) WCore	Part III and/or Part IV Elective(s) WCore
Senior Year	NEURO 409 and/or Part III/IV Elective(s) WCore	NEURO 409 and/or Part III/IV Elective(s) WCore