COLLEGE OF ARTS AND SCIENCES

NEUROSCIENCE

Faculty

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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.

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 students 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.

Classes listed as required classes for both majors/minors may be applied to both. The Neuroscience program allows for the double-dipping of up to four credits from neuroscience-related fields (Biology, Math, Physics, Computer Science, Data Science, Psychology, or Chemistry) that can be applied toward fulfilling the elective requirements of the Neuroscience major. Other than this, students choosing a double major or minor within the science program or psychology may not apply electives to more than one major or#minor.

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

- 124 total hours
- 30 upper division hours
- WCore or Honors College requirements

Neuroscience Major

Requirement Description	Credit Hours	Prerequisites
I. World Language Requirement	**8**	
Neuroscience majors must complete **eight (8)** 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

Requirement Description	Credit Hours	Prerequisites
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	
Choose one of the following courses:		
DATA 350 Statistical Modeling	4	DATA 220
MATH 201 Calculus I	4	MATH 144 or placement test
WCSAM 203 Linear Algebra	4	MATH 144 or placement test
III. Natural Science and Math Electives	**20**	
Complete twenty (20) credit hours from the following list of courses. Twelve (12) of these hours must be upper division courses.		
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 and CHEM 303
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
Chemistry		
CHEM 303 Organic Chemistry I and Lab	4	CHEM 112
CHEM 304 Organic Chemistry II and Lab	4	CHEM 303
Computer Science		
CMPT 201 Introduction to Computer Science	4	co-requisite: MATH 101
Data Science		
DATA 370 Statistical Learning	4	DATA 350
Mathematics		
MATH 202 Calculus II	4	MATH 201 or placement test
MATH 203 Multivariate Calculus	4	MATH 202
MATH 363 Differential Equations	4	MATH 202
Neuroscience		
NEURO 300 Special Topics in Neuroscience	2–4	
NEURO 305 Human Brain Development	4	NEURO 205; co-requisite: PSYC 203
NEURO 402 Behavioral Endocrinology	4	NEURO 302 or PSYC 390 and NEURO 205
NEURO 430 or WCSAM 400 Independent Thesis Research (May be taken two semesters for credit) or Science Capstone	2	NEURO 302 or 390

Requirement Description	Credit Hours	Prerequisites
NEURO 434 Social Neuroscience	4	PSYC 390 or NEURO 302 and PSYC 216 or NEURO 205
Physics		
PHYS 151 Principles of Physics I and Lab	4	MATH 144
PHYS 152 Principles of Physics II and Lab	4	PHYS 151 or 211
PHYS 211 Physics for Scientists and Engineers I and Lab	4	MATH 144; co-requisite: MATH 201
PHYS 212 Physics for Scientists and Engineers II and Lab	4	PHYS 211; co-requisite: MATH 202
Psychology		
PSYC 203 Lifespan Development	4	
PSYC 209 Cognitive Psychology	4	PSYC 105
PSYC 362 Psychological Disorders	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**	
Neuroscience majors must choose eight (8) hours of additional neuroscience electives chosen from the following courses:		
NEURO 306 Behavioral Neuroscience and Lab	4	NEURO 205
NEURO 310 Applied Neuroanatomy	4	
NEURO 403 Cellular Neuroscience and Lab	4	BIOL 204, 205, CHEM 112, and NEURO 302
NEURO 408 Cognitive Neuroscience and Lab	4	PSYC 105, NEURO 205, and PSYC 390 or NEURO 302
Total Hours for the Neuroscience Major	**74-76**	

Recommended Plan of Study

	Fall Semester	Spring Semester
Year 1	PSYC 105 or NEURO 205 CHEM 111 Language or WCore	PSYC 105 or NEURO 205 CHEM 112 Language or WCore
Year 2	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
Year 3	Part III and/or Part IV Elective(s) WCore	Part III and/or Part IV Elective(s) WCore
Year 4	NEURO 409 and/or Part III/IV Elective(s) WCore	NEURO 409 and/or Part III/IV Elective(s) WCore