

Neuroscience, Ph.D.

Doctor of Philosophy

MAJOR REQUIREMENTS

Code	Title	Hours
BMS 700	Scientific Integrity	1
BMS 701	Scientific Rigor and Ethics	1
BMS 702	Biomedical Lab Experience	2
BMS 706	Biomedical Research Methods	1
BMS 707	Experiential Learning for Biomedical Trainees	2
BMS 720	Scientific Writing	2
BMS 747	Foundations for Contemporary Biomedical Research I	4
BMS 777	Foundations for Contemporary Biomedical Research 2	4
Research		35
NSCI 797	Research	
Research Forum		7
NSCI 761	Neuroscience Research Forum	
Journal Club		5
NSCI 760	Neuroscience Journal Club	
NSCI 764	Human Functional Neuroanatomy	3
NSCI 770	Fundamentals of Neuroscience 1	6
F31+ Document and Oral Defense		
Dissertation Proposal		
Dissertation Defense		
Electives		6
Total Hours		79

Suggested Plan of Study

First Year

Fall	Hours	Spring	Hours	Summer	Hours
BMS 700		1 BMS 701		1 NSCI 797	1
BMS 702		2 NSCI 760		1	
BMS 706		1 NSCI 761		1	
BMS 747		4 NSCI 797		3	
BMS 777		4 NSCI 764		3	
		12			9
					1

Second Year

Fall	Hours	Spring	Hours	Summer	Hours
NSCI 760		1 NSCI 760		1 BMS 720	2
NSCI 761		1 NSCI 761		1 NSCI 797	1
NSCI 770		6 Written Rigor of Prior Research		F31+ Document and Oral Defense	
NSCI 797		3 NSCI 797		7	
		11			9
					3

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
NSCI 760		1 NSCI 760		1 NSCI 797	1
NSCI 761		1 NSCI 761		1 BMS 707	2
NSCI 797		5 NSCI 797		7	
Elective		2			

Dissertation Proposal

		9		9		3
Fourth Year						
Fall	Hours	Spring	Hours	Summer	Hours	
NSCI 761		1 NSCI 761		1 NSCI 797		1
NSCI 797		8 NSCI 797		8		
		9		9		1

Total credit hours: 85

NOTE: The graduate curriculum is finalized with a plan of study once the mentor and laboratory have been selected in the first year. The plan of study is developed by the graduate committee in consultation with the student. The courses listed above include the required and elective coursework necessary for the student to finalize his/her plan of study. When the student enters the laboratory of his/her doctoral dissertation mentor repetitive enrollments in research, seminars, and colloquia are typical and will determine total hours necessary for degree completion.

*This is a suggested plan of study. Course sequences and length of time in program may vary depending on student and altered total credit hours.

Seminars and Research Forum

Students are required to register for seminar in each semester of residence.

Journal Club

Students are required to enroll in Journal Club each semester. The course involves the presentation and discussion of current research papers and will help acquaint students with the variety of methods used in scientific research.

Doctoral Research

Students will conduct research with a dissertation mentor during time in the program. Students register for research credits each semester, and their performance is graded by their dissertation mentor.

Written Rigor of Prior Research

A Written Rigor of Prior Research is completed during the second year of study.

F31+ Document and Oral Defense

An F31+ Document and Oral Defense will be completed in the second year of study.

Dissertation Proposal/Ph.D. Candidacy

The dissertation proposal is completed during the third year of study. Admission to Ph.D. candidacy occurs following the successful defense of the dissertation proposal.

Dissertation Defense and First-Author Paper Requirement

Students are allowed to defend their dissertation when a minimum of one manuscript with the student as first author, based on dissertation research, is accepted in a peer-reviewed journal. A second manuscript is also required, but does not have to be first-authored or on the dissertation research. The final examination for the Ph.D. degree consists of orally defending a written dissertation in a public seminar and then in private to the graduate dissertation committee. Satisfactory performance in the oral defense will result in recommendation for granting of the Ph.D. degree.

Major Learning Outcomes

NEUROSCIENCE

- Independently design experimental protocols, conduct the experiments, analyze the results, and defend the experimental approach to other scientists.
- Develop and plan the test of hypotheses regarding significant problems in neuroscience.
- Ability to effectively reference the relevant literature in support of the student's research project. Ability to identify significant gaps in knowledge on a scientific topic in neuroscience. Ability to critically evaluate the strengths and weaknesses of the scientific literature.
- Effectively communicate research in abstracts written for research presentations, manuscripts for publication, research grant proposals, and the final dissertation.

- Effectively communicate both the student's research and general scientific topics in both informal and formal settings.
- Develop experimental rigor and strategies for conducting reproducible research.
- Demonstrate principles of ethics associated with appropriate research conduct.