

## BIOLOGY M.S.

All students must meet the Requirements for the Master's Degree

### OVERVIEW

Students pursue coursework and conduct their thesis research with Biology Graduate Program faculty in one or several biological sub-disciplines.

Learning goals for the M.S. in Biology Thesis-based (T), or Course-based (C) degree students:

- (T) Learning Goal 1: Be able to design and execute scientific experiments; analyze and communicate experimental results orally and in writing.
- (C) Learning Goal 1: Be able to design scientific experiments and analyze and communicate results orally and in writing.
- (T/C) Learning Goal 2: Have a working knowledge of the fundamental literature, concepts and ideas of their field of study.
- (T/C) Learning Goal 3: Have a broad factual and conceptual knowledge and understanding of biology.

### SPECIFIC REQUIREMENTS

#### Requirements for Admission to Graduate Studies for the Degree of Master of Science

An undergraduate major in the life sciences. Acceptability to the faculty member with whom the candidate wishes to do thesis research. There is no GRE requirement for any Biology graduate program.

#### Minimum Degree Requirements

##### Thesis-based

A total of 30 credits, 15 of which must be graded course credits. Students may take up to 3 credits of 3000- or 4000-level coursework for graduate credit with approval of the course instructor, the Director of Graduate Studies, and the Graduate College. Thesis research (6 to 15 credits) and successful defense of thesis are required.

Requirement Description		Credits
<b>Required Courses (10 credits)</b>		
BIOL 6005	Graduate Seminar	1
BIOL 6000	Professional Skills and Ethics	2
BIOL 6100	Computational Biology	4
BIOL 6015	Scientific Writing in Life Sci	2
BIOL 6020	Foundations in Eco & Evo	1
or BIOL 6025	Foundations in Cell & Dev	
<b>Electives (Minimum of 5 credits chosen from the list below or other courses approved by studies committee)</b>		
CLBI 6010	Cell Biology	3

CLBI 6020	Science Communication	2
CLBI 7010	Critical Reading & Analysis	2
CLBI 7020	Biomedical Data Analysis	2
CS 6020	Modeling Complex Systems I	3
CS 6520	Evolutionary Computation	3
MMG 6200	Cellular Microbiology	4
NR 6430	Fndmtls of Geog Info Systems	3
NSCI 6010	Intr Functional Neuroimaging 2	3
NSCI 6270	Resp Conduct in Biomed Rsch	1
PBIO 6940	Data Modeling for Envir Scienc	3
PATH 6070	Molecular Pathology	3
PATH 6280	Techniques in Microscopy	3
PHRM 5400	Molecules & Medicine	3
PHRM 5720	Gr Toxicology	3
PHRM 5900	Gr Adv Pharmacology Topics	3
STAT 6870	Data Science II	3
STAT 7980	Applied Geostatistics	3
BHSC 5000-5900		
BIOC 6000-6100, 7000-7100		
BIOC, BIOL, BHSC, CLBI, MMG, MPBP, NSCI, PATH, PHRM 5990, 6990, 7990		
BIOL 6200-6300		
MMG 5000-5900		
MPBP 6000-6300		
NSCI 5000-5900		
<b>Research (6-15 credits)</b>		
BIOL 6391	Master's Thesis Research	6-15

### COURSE-BASED

A total of 30 credits, 15 of which must be graded course credits. Students may take up to 3 credits of 3000- or 4000-level coursework for graduate credit with approval of the course instructor, the Director of Graduate Studies, and the Graduate College.

Requirement Description		Credits
<b>Required Courses (10 credits)</b>		
BIOL 6010	Biology Seminar	1
BIOL 6000	Professional Skills and Ethics	2

BIOL 6100	Computational Biology	4
BIOL 6015	Scientific Writing in Life Sci	2
BIOL 6020	Foundations in Eco & Evo	1
or BIOL 6025	Foundations in Cell & Dev	
<b>Electives (Minimum of 20 credits chosen from the list below or other courses approved by studies committee)</b>		
CLBI 6010	Cell Biology	3
CLBI 6020	Science Communication	2
CLBI 7010	Critical Reading & Analysis	2
CLBI 7020	Biomedical Data Analysis	2
CS 6020	Modeling Complex Systems I	3
CS 6520	Evolutionary Computation	3
MMG 6200	Cellular Microbiology	4
NR 6430	Fndmntls of Geog Info Systems	0 or 3
NSCI 6010	Intr Functional Neuroimaging 2	3
NSCI 6270	Resp Conduct in Biomed Rsch	1
PBIO 6940	Data Modeling for Envir Scienc	3
PATH 6070	Molecular Pathology	3
PATH 6280	Techniques in Microscopy	3
PHRM 5400	Molecules & Medicine	3
PHRM 5720	Gr Toxicology	3
PHRM 5900	Gr Adv Pharmacology Topics	3
STAT 6870	Data Science II	3
STAT 7980	Applied Geostatistics	3
BHSC 5000-5900		
BIOC 6000-6100, 7000-7100		
BIOC, BIOL, BHSC, CLBI, MMG, MPBP, NSCI, PATH, PHRM 5990, 6990, 7990		
BIOL 6200-6300		
MMG 5000-5900		
MPBP 6000-6300		
NSCI 5000-5900		

### Comprehensive Examination

Thesis-based students take Scientific Writing in Life Sciences (BIOL 6015) the spring semester of their first year during which they prepare a written research proposal. The comprehensive exam evaluates the written proposal and has two oral parts. The first

oral part is a defense of the written proposal. The second oral part evaluates the student's understanding of the broad range of concepts in the student's discipline. The comprehensive examination takes place before the end of May of their first year.

Course-based students take Scientific Writing in Life Sciences (BIOL 6015) the spring semester of their first year (dually enrolled year) during which they prepare a written review article on a topic of choice. The Instructor for BIOL 6015 will review the written document and provide a recommendation to the Graduate Affairs Committee, which will make a decision on the outcome before the end of May of the student's first year.

### Requirements for Advancement to Candidacy for the Degree of Master of Science

Successful completion of the comprehensive examination is required for advancement to candidacy.