MS Biology Fall 2025

The following requirements must be fulfilled:

The general requirements stated under Columbian College of Arts and Sciences, Graduate Programs.

Completion of all requirements for one of the following 30-credit concentrations: biodiversity science concentration; cellular and molecular biology concentration; or research lab thesis-based concentration.

Biodiversity science concentration	
30 credits, including 6 credits in required core courses, 3 credits in quantitative analysis, 6 credits in professional experience, and 15 credits in elective courses.	
Required	
Core courses	
BISC 6102	Scientific Presentation
BISC 6103	Professional Development
BISC 6238	Foundations of Ecology
or BISC 6276	Foundations in Evolution
Quantitative analysis course *	
BISC 6233	Biometry
A total of 6 credits taken in research and/or internship. Courses can be repeated for credit.	
BISC 6295	Research
BISC 6299	Internship in Biological Sciences
Electives	
15 credits in elective courses selected from the following:	
BIOC 6223	Bioinformatics
BIOC 6243	Applied Bioinformatics

BISC 6206	Current Topics in Evolutionary Ecology (can be repeated for credit provided the topic differs)
BISC 6207	Seminar: Current Topics in Systematic Biology (can be repeated for credit provided the topic differs)
BISC 6210	Methods of Study of Evolution
BISC 6211	Biogeography and Speciation
BISC 6214	The Phylogenetic Basis of Comparative Biology
BISC 6215	Vertebrate Phylogeny
BISC 6216	Morphological Systematics
BISC 6225	Molecular Phylogenetics
BISC 6232	Organismal Form and Function
BISC 6243	Seminar: Ecology (can be repeated for credit provided the topic differs)
BISC 6260	Conservation Biology
GEOG 6220	Seminar: Climatic Change
GEOG 6303	Introduction to Remote Sensing
GEOG 6304	Geographical Information Systems I
PUBH 6860	Principles of Bioinformatics
PUBH 6899	Topics in Biostatistics and Bioinformatics (can be repeated for credit provided the topic differs)
Cellular and molecular biology concentration	
30 credits, including 6 credits in required core courses, 9 credits in laboratory experience courses, 9 credits in quantitative analysis and bioinformatics courses, and 6 credits in elective courses.	
Required	

Core courses	
BISC 6102	Scientific Presentation
BISC 6103	Professional Development
BISC 6205	Foundations in Cell and Molecular Biology
Laboratory experience	
9 credits in courses selected from the following:	
BISC 6234	Microbial Genomics Laboratory
BISC 6274	Gene Regulation and Genetic Engineering
BISC 6275	Introduction to Recombinant DNA Techniques
BISC 6295	Research (can be repeated for credit)
BISC 6299	Internship in Biological Sciences (can be repeated for credit)
Quantitative analysis and bioinformatics courses	
9 credits in courses selected from the following:*	
BIOC 6223	Bioinformatics
BIOC 6240	Next Generation Sequencing
BIOC 6242	Bioscience Big Data Statistics
BIOC 6243	Applied Bioinformatics
PUBH 6002	Biostatistical Applications for Public Health
PUBH 6851	Introduction to R for Public Health Research
PUBH 6852	Introduction to Python for Public Health Research
PUBH 6860	Principles of Bioinformatics
PUBH 6899	Topics in Biostatistics and Bioinformatics (can be repeated for credit provided the topic differs)
PUBH 8885	Computational Biology

Electives	
6 credits in elective courses selected from the following:	
BIOC 6221	Proteins, Pathways, and Human Health
BIOC 6228	Research Essentials and Bioscience Careers
BIOC 6237	Proteomics and Biomarkers
BISC 6212	Virology and Antiviral Immunity
BISC 6218	Innate Immunity
BISC 6219	Host-Microbe Interactions
BISC 6251	Evolutionary Developmental Biology
MICR 6236	Fundamentals in Geonomics and Proteomics I
MICR 8210	Infection and Immunity
PUBH 6276	Public Health Microbiology
Research lab thesis-based concentration	
30 credits, including 6 credits in required core courses, 18 credits in elective courses, and 6 credits in thesis. The research thesis must be completed and successfully defended.	
Required	
Core courses	
BISC 6102	Scientific Presentation
BISC 6103	Professional Development
BISC 6205	Foundations in Cell and Molecular Biology
or BISC 6238	Foundations of Ecology
or BISC 6276	Foundations in Evolution
Thesis	
BISC 6999	Thesis Research (taken twice for a total of 6 credits)
Electives	

18 credits in elective courses selected in consultation with the thesis advisor.

Students use elective credits to map out the courses to be taken throughout the degree. The program of study is prepared in the first semester under the guidance of the student's thesis advisor. Selected courses are those most appropriate for supporting and achieving the specific research-focused goals of the student's thesis.

*BISC 6243 can count as a quantitative analysis course when taught as Data Analysis in R.

Undergraduate courses taken for graduate credits—A limited number of upper-division undergraduate courses can be taken for graduate credit with the permission of the advisor and the instructor. For the biodiversity science concentration, the following courses can be counted as electives if taken for graduate credit: BISC 2216, BISC 2224, and BISC 2339. For the cellular and molecular biology concentration, the following courses can be counted as laboratory experience courses if taken for graduate credit: BISC 3208, BISC 3209, BISC 3210, BISC 3211, and BISC 3215. Students should consult with the program advisor before registering for undergraduate courses.