GENETICS AND GENOMICS, B.S.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext) section of the *Guide*.

General Education

- Breadth—Humanities/Literature/Arts: 6 credits
- Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits
- Breadth—Social Studies: 3 credits
- Communication Part A & Part B *
- Ethnic Studies *
- Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF AGRICULTURAL AND LIFE SCIENCES REQUIREMENTS

In addition to the University General Education Requirements, all undergraduate students in CALS must satisfy a set of college and major requirements. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies, Science, and Capstone), but courses counted toward university requirements may also be used to satisfy a college and/or a major requirement; similarly, courses counted toward college requirements may also be used to satisfy a university and/or a major requirement.

COLLEGE REQUIREMENTS FOR ALL CALS B.S. DEGREE PROGRAMS

Code	Title	Credits
Quality of Work: Students must maintain a minimum cumulative grade point average of 2.000 to remain in good standing and be eligible for graduation.		
Residency: Students must complete 30 degree credits in residence at UW–Madison after earning 86 credits toward their undergraduate degree.		
First Year Seminar (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSFirstYearSeminarCourses)		1
International Studies (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSInternationalStudiesCourses)		3
Physical Science Fundamentals		4-5
CHEM 103	General Chemistry I	
or CHEM 108	Chemistry in Our World	
or CHEM 109	Advanced General Chemistry	
Biological Science		5
Additional Science (Biological, Physical, or Natural)		3
Science Breadth (Biological, Physical, Natural, or Social)		3
CALS Capstone Learning Experience: included in the requirements for each CALS major (see "Major Requirements") (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSCapstoneRequirement)		

MAJOR REQUIREMENTS

Code	Title	Credits
Mathematics and Statistics		
Complete one of the following:		5-10
MATH 221	Calculus and Analytic Geometry 1	
MATH 171 & MATH 217	Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II	
Complete one of the following:		3
STAT 371	Introductory Applied Statistics for the Life Sciences	
STAT 301	Introduction to Statistical Methods	
Chemistry		
Complete one of the following:		5-9
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	
CHEM 109	Advanced General Chemistry	
CHEM 115 & CHEM 116	Chemical Principles I and Chemical Principles II	
Complete one of the following:		3-6
CHEM 341	Elementary Organic Chemistry	
CHEM 343 & CHEM 345	Organic Chemistry I and Organic Chemistry II [1]	
Physics		
Complete one of the following:		10
PHYSICS 103 & PHYSICS 104	General Physics and General Physics (recommended)	
PHYSICS 201 & PHYSICS 202	General Physics and General Physics	
PHYSICS 207 & PHYSICS 208	General Physics and General Physics (recommended)	

Biology		
Complete one of the following options:		10
Option 1:		
BIOLOGY/ BOTANY/ ZOOLOGY 151 & BIOLOGY/ BOTANY/ ZOOLOGY 152	Introductory Biology and Introductory Biology (recommended)	
Option 2:		
BOTANY/ BIOLOGY 130	General Botany	
ZOOLOGY/ BIOLOGY 101 & ZOOLOGY/ BIOLOGY 102	Animal Biology and Animal Biology Laboratory	
Option 3:		
BIOCORE 381 & BIOCORE 383	Evolution, Ecology, and Genetics and Cellular Biology	
Select two of the following labs:		
BIOCORE 382	Evolution, Ecology, and Genetics Laboratory	
BIOCORE 384	Cellular Biology Laboratory	
BIOCORE 486	Principles of Physiology Laboratory	
Core Requirements		
BIOCHEM 501	Introduction to Biochemistry [2]	3
or BIOCHEM 507	General Biochemistry I	
Complete one of the following options:		6
Option 1:		
GENETICS 467 & GENETICS 468	General Genetics 1 and General Genetics 2 (preferred)	
Option 2:		
GENETICS 466	Principles of Genetics (consult advisor (467 & 468 preferred))	
additional 3 credit Genetics depth course (see course list below) [3]		
Select 2 credits from the following:		2
GENETICS 545	Genetics Laboratory	
GENETICS 299	Independent Study [4]	
GENETICS 699	Special Problems [4]	
GENETICS 681	Senior Honors Thesis	
GENETICS 682	Senior Honors Thesis	
GENETICS 399	Coordinative Internship/ Cooperative Education	
Genetics Depth		**9**
See course list below		
Genetics Breadth		**6**
See course list below		
Capstone		
Select one of the following:		3-9
Option 1:		
GENETICS/ BIOLOGY 522	Communicating Evolutionary Biology (Three-credit version only) [5]	
Option 2:		
GENETICS 527	Developmental Genetics for Conservation and Regeneration (offered in fall semester) [5]	
Option 3:		
GENETICS 566	Advanced Genetics (offered in spring semester)	
Option 4:		
GENETICS 564	Genomics and Proteomics (offered in spring semester) [5]	
Option 5 (must be taken concurrently):		
GENETICS 699	Special Problems (offered in fall semester)	
GENETICS 567	Companion Research Seminar (offered in fall semester)	
Option 6 (must be taken concurrently):		
GENETICS 681	Senior Honors Thesis	
GENETICS 682	Senior Honors Thesis	
GENETICS 567	Companion Research Seminar (offered in fall semester)	
Total Credits		**65-83**

1

If CHEM 343 is taken, it must be taken as a part of CHEM 343 & CHEM 345, the latter of which counts as a Genetics Breadth requirement.

2

If BIOCHEM 507 is taken, it must be taken as a part of BIOCHEM 507 & BIOCHEM 508, the latter of which counts as a Genetics Breadth requirement.

3

Additional Depth course will not count toward the 9-credit Genetics Depth requirement.

4

Consult with your advisor if genetics-related research will be performed in a department other than Genetics.

5

May count for Genetics Depth or Capstone, but not both.

GENETICS DEPTH & BREADTH COURSES

DEPTH

Code	Title	Credits
GENETICS 520	Neurogenetics	3
GENETICS/ BIOLOGY 522	Communicating Evolutionary Biology	2-3
GENETICS 525	Epigenetics	3
GENETICS 527	Developmental Genetics for Conservation and Regeneration	3
GENETICS 528	Banking Animal Biodiversity: International Field Study in Costa Rica	1
GENETICS 548	The Genomic Revolution	3
GENETICS/HORT 550	Molecular Approaches for Potential Crop Improvement	3
GENETICS 564	Genomics and Proteomics	3

GENETICS/ MD GENET 565	Human Genetics	3
GENETICS 566	Advanced Genetics	3
GENETICS 605	Clinical Cases in Medical Genetics	3
GENETICS/ BIOCHEM/ MICROBIO 612	Prokaryotic Molecular Biology	3
GENETICS/ BIOCHEM/ MD GENET 620	Eukaryotic Molecular Biology	3
GENETICS/ CHEM 626	Genomic Science	2
GENETICS 627	Animal Developmental Genetics	3
GENETICS/ BIOCHEM 631	Plant Genetics and Development	3
GENETICS 633	Population Genetics	3
GENETICS/ BOTANY/M M & I/ PL PATH 655	Biology and Genetics of Fungi	3
GENETICS/ MD GENET 662	Cancer Genetics	3
GENETICS/ MD GENET 677	Advanced Topics in Genetics	1-3

BREADTH

Code	Title	Credits
Physical Science:		
BIOCHEM 508	General Biochemistry II	3-4
BIOCHEM 550	Principles of Human Disease and Biotechnology	2
CHEM 344	Introductory Organic Chemistry Laboratory	2
CHEM 345	Organic Chemistry II	3
Integrative Biology:		
BIOCORE 485	Principles of Physiology	3
BIOCORE 587	Biological Interactions	3
BOTANY/ANTHRO/ ZOOLOGY 410	Evolutionary Biology	3
BOTANY/ PL PATH 563	Phylogenetic Analysis of Molecular Data	3
MICROBIO 303	Biology of Microorganisms	3
MICROBIO 304	Biology of Microorganisms Laboratory	2
MICROBIO 470	Microbial Genetics & Molecular Machines	3
MICROBIO/ ONCOLOGY 545	Topics in Biotechnology	1
MICROBIO 632	Industrial Microbiology/ Biotechnology	2
M M & I 341	Immunology	3
M M & I/PATH-BIO 528	Immunology	3
PL PATH 622	Plant-Bacterial Interactions	2-3
PL PATH/ ONCOLOGY 640	General Virology-Multiplication of Viruses	3
ZOOLOGY/ ENVIR ST/ F&W ECOL 360	Extinction of Species	3
ZOOLOGY 425	Behavioral Ecology	3
ZOOLOGY 470	Introduction to Animal Development	3
ZOOLOGY 555	Laboratory in Developmental Biology	3
ZOOLOGY 570	Cell Biology	3
Agricultural Ecosystems:		
AGRONOMY/ HORT 338	Plant Breeding and Biotechnology	3
AGRONOMY/ BOTANY/HORT 340	Plant Cell Culture and Genetic Engineering	3
AGRONOMY/ HORT 501	Principles of Plant Breeding	3
AGRONOMY/ HORT 502	Techniques of Plant Breeding	1
AN SCI/DY SCI 361	Introduction to Animal and Veterinary Genetics	2
AN SCI/DY SCI 362	Veterinary Genetics	2
AN SCI/DY SCI 363	Principles of Animal Breeding	2
HORT 500		3
PL PATH/BOTANY/ ENTOM 505	Plant-Microbe Interactions: Molecular and Ecological Aspects	3
Computational Biology:		
B M I/ COMP SCI 576	Introduction to Bioinformatics	3

UNIVERSITY DEGREE REQUIREMENTS

Total Degree	To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.
Residency	Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. “In residence” credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.
Quality of Work	Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.