

Detailed Undergraduate Genetics Major Degree Requirements 2015-2016 University Catalog

The B.S. degree in Genetics is offered in both the College of Agriculture and Life Sciences (AGLS) and the College of Liberal Art and Sciences (LAS). The AGLS and LAS majors are nearly identical in their scientific components, whereas the general education courses vary to suit the interests and career objectives of individual students. The degree requires a minimum of 120 credits.

Many of the requirements are electives that can be chosen from approved lists. These lists or links to them appear on pages 3-5 of this document.

GENETICS MAJOR REQUIREMENTS FOR AGLS OR LAS

Genetics and Life Sciences (32 - 36 cr)

- 1) GEN 110, Genetics Orientation (1 cr) *fall only*
- 2) BIOL 211 and 211L, Principles of Biology I (4 cr) *fall, spring, summer (no labs offered)*
- 3) BIOL 212 and 212L, Principles of Biology II (4 cr) *fall, spring*
- 4) BIOL 312, Ecology (4 cr) **(AGLS only)** *summer or fall only*
- 5) GEN 313 and 313L, Principles of Genetics (4 cr) *fall, spring, summer (no labs offered)*
- 6) BIOL 314, Principles of Molecular Cell Biology (3 cr) *fall, spring*
- 7) BIOL 315, Biological Evolution (3 cr) *fall, spring, summer*
- 8) GEN 409 **or** GDCB 511, Molecular Genetics (3 cr), *fall only*
- 9) GEN 410, Analytical Genetics (3 cr) *spring only*
- 10) GEN 462, Evolutionary Genetics (3 cr) *fall only* **or** EEOB 561, Evolutionary and Ecological Genomics (3 cr) *spring only* **or** EEOB 563, Molecular Phylogenetics (3 cr) *spring only*
- 11) GEN 491, Undergraduate Seminar (1 cr) *fall, spring*
- 12) MICRO 302, Biology of Microorganisms (3 cr) *fall, spring, summer*

Note: A grade of C- or better is required in each of the courses in this group.

Supporting Sciences (34 - 36 cr)

- 1) CHEM 177 and 177L, General Chemistry I (5 cr)
- 2) CHEM 178 and 178L, General Chemistry II (4 cr)
- 3) CHEM 331/L, Organic Chemistry I (4 cr)
- 4) CHEM 332/L, Organic Chemistry II (4 cr)
- 5) PHYS 111/112, General Physics I and II (10 cr)
or
PHYS 221/222, Classical Physics I and II (10 cr)
- 6) BIOCHEMISTRY (6 - 7 cr)
Option 1
 - a) BBMB 404, Biochemistry I (3 cr) **and**
 - b) BBMB 405, Biochemistry II (3 cr)**or**
BBMB 411, Techniques in Biochemical Research (3 cr)
or
CHEM 211 and 211L, Quantitative and Environmental Analysis (4 cr)
or
CHEM 325, Chemical Thermodynamics (3 cr)

Option 2

- a) BBMB 420, Physiological Biochemistry (3 cr) **and**
 - b) BBMB 411, Techniques in Biochemical Research (3 cr)
or
CHEM 211 and 211L, Quantitative and Environmental Analysis (4 cr)
or
CHEM 325, Chemical Thermodynamics (3 cr)
- 8) Advanced Science Elective courses from among the following choices (6 cr)
One of: AGRON/HORT 421 **or** ANS 352
AN S 331, 332, 333, 345
ANTHR 307, 319, 424
BBMB courses numbered 400 or above
BIOL courses numbered 300 or above except: 307, 355, 356, 366, 393A, 393B,
491, 495, 498

CHEM 211/211L and CHEM courses numbered 300 or above
EEOB 561, 562, 563, 566, 567
GEN 340, 349, 444, 490, 499
GDCB courses except: 508, 511
HORT 423
MICRO courses numbered 300 or above, except 302
PHYS 461
PSYCH 310
STAT 301, 401, 402, 403

Notes:

- A grade of C⁻ or better is required in each course. Satisfactory grades in S/F courses GEN 490U or 490S are also acceptable.
- Courses selected for this area cannot be used to meet any other degree requirement.

Mathematics (11 - 12 cr)

Option 1

- 1) MATH 165/166, Calculus I and II (8 cr)
- 2) STAT 101, Principles of Statistics (4 cr)
or
STAT 104, Introduction to Statistics (3 cr)

Option 2

- 1) MATH 181/182, Calculus and Mathematical Modeling for Life Sciences (8 cr)
- 2) STAT 101, Principles of Statistics (4 cr)
or
STAT 104, Introduction to Statistics (3 cr)

Option 3

- 1) STAT 101, Principles of Statistics (4 cr)
or
STAT 104, Introduction to Statistics (3 cr)
- 2) STAT 301, Intermediate Statistical Concepts and Methods (4 cr)
or

- STAT 401, Statistical Methods for Research Workers (4 cr) (being phased out for undergraduates)
- 3) MATH 160, Survey of Calculus (4 cr)

COLLEGE OF AGRICULTURE AND LIFE SCIENCES REQUIREMENTS

Communications (13 cr)

- 1) ENGL 150, Critical Thinking and Communication (3 cr)
 - 2) ENGL 250, Written, Oral, Visual, and Electronic Composition (3 cr)
 - 3) LIB 160, Library Instruction (1 cr)
 - 4) Advanced English Writing course from department-approved list (3 cr)
 - 5) SPCM 212, Fundamentals of Public Speaking (3 cr)
- or
- AGEDS 311, Presentation Strategies (3 cr)

Note: The minimum acceptable grade for courses in this group is C.

General Education Requirements (15 cr)

- 1) International Perspectives course from university-approved list (3 cr)
- 2) U.S. Diversity course from university-approved list (3 cr)
- 3) Humanities course from college-approved list (3 cr)
- 4) Social Sciences course from college-approved list (3 cr)
- 5) Ethics course from college-approved list (3 cr)

Note: The minimum acceptable grade for courses in this group is C.

COLLEGE OF LIBERAL ARTS AND SCIENCES REQUIREMENTS

Communications (10 cr)

- 1) ENGL 150, Critical Thinking and Communication (3 cr)
- 2) ENGL 250, Written, Oral, Visual, and Electronic Composition (3 cr)
- 3) LIB 160, Library Instruction (1 cr)
- 4) Advanced English Writing course from department-approved list (3 cr)

Note: An average grade of C is required for this group, and the minimum acceptable grade for any individual course is C-.

General Education Requirements (21 cr)

- 1) Humanities courses from college-approved list (12 cr including 3 cr of Science/Humanities Bridge, see list)
- 2) Social Sciences courses from college-approved list (9 cr)

International Perspectives, U.S. Diversity, and Science/Humanities Bridge Course

- 1) International Perspectives course from university-approved list (3 cr)
- 2) U.S. Diversity course from university-approved list (3 cr)
- 3) Science/Humanities Bridge course from department-approved list (3 cr)

Note: Each of these courses may be counted as General Education Requirements if they are included in both of the appropriate approved lists.

World Language Courses (8 cr)

The World Language requirement is met by three or more years of high school foreign language. For students with one or two years of high school language study the requirement can be met by taking one course (4 cr) or passing an examination for course credit. Students with no language study in high school are required to take 8 cr of college-level World Language courses.

SUMMARY OF DIFFERENCES BETWEEN THE AGLS AND LAS MAJORS

Course	Credits Required	
	AGLS	LAS
World Languages	None	0-8
BIOL 312, Ecology	4	None
General Education Requirements	9	21
Speech	3	None
Total Credits	120	120

LISTS OF ELECTIVE CHOICES

University-Approved International Perspectives Courses

<http://www.registrar.iastate.edu/courses/InternationalPerspectives-current.html>

University-Approved U.S. Diversity Courses

<http://www.registrar.iastate.edu/courses/USDiversity-current.html>

College-Approved Humanities Courses

AGLS

<http://www.agstudent.iastate.edu/agriculturestudentservices/humanities.htm>

LAS

<http://www.las.iastate.edu/students/academics/general-education/general-education-approved-course-list-2015-16/#I.%20Arts%20and%20Humanities>

College-Approved Social Science Courses

AGLS

http://www.agstudent.iastate.edu/agriculturestudentservices/social_sciences.htm

LAS

<http://www.las.iastate.edu/students/academics/general-education/general-education-approved-course-list-2015-16/#III.%20Social%20Sciences>

AGLS College-Approved Ethics Courses

<http://www.agstudent.iastate.edu/agriculturestudentservices/ethicslist.html>

Department-Approved Advanced English Writing Courses

ENGL 302: Business Communication
ENGL 303: Free-Lance Writing for Popular Magazines
ENGL 304: Creative Writing - Fiction
ENGL 305: Creative Writing - Nonfiction
ENGL 306: Creative Writing - Poetry
ENGL 309: Report and Proposal Writing
ENGL 310: Rhetorical Analysis
ENGL 312: Biological Communication
ENGL 313: Writing for the World Wide Web
ENGL 314: Technical Communication
ENGL 315: Creative Writing - Screenplays
ENGL 316: Creative Writing - Playwriting
JLMC 347: Science Communication

Department-Approved Science/Humanities Bridge Courses

HIST 280, 281: Introduction to History of Science
HIST 284, 285: Wonders of the World, Ancient/Modern
HIST 323: Science and Religion
HIST 380: History of Women in Science, Technology, and Medicine
HIST 388: History of Modern Astronomy
HIST 472: U.S. Environmental History
HIST 482: Birth, Death, Medicine, and Disease
HIST 483: Modern Science and Human Nature
HIST 486: History of Medicine, Gender, and the Body
HIST 488: American Stuff, Colonial Times to the Present
HIST 489: History of American Science
PHIL 206: Introduction to Logic and Scientific Reasoning
PHIL 230: Moral Theory and Practice
PHIL 235: Ethical Issues in a Diverse Society
PHIL 330: Ethical Theory
PHIL 331: Moral Problems in Medicine
PHIL 334: Environmental Ethics
PHIL 336: Bioethics and Biotechnology
PHIL 343: Philosophy of Technology
PHIL 380: Philosophy of Science
PHIL 465: Brains, Minds, and Computers
PHIL 480: Controversies in Science

PHIL 483: Philosophy of Biology

RELIG 323: Science and Religion (cross listed with HIST 323)

RELIG 360: Religious Ethics

RELIG 384: Religion and Ecology

BIOL 307: Women in Science and Engineering