

# Biology Degree Requirements 2009-11 University Bulletin www.biology.iastate.edu

Biology majors are required to complete 120 credits to graduate. Included within this are specific University, College and Major requirements, which must also be fulfilled. Students are ultimately responsible for all issues concerning the satisfactory completion of graduation requirements. Information in this document is subject to change.

## University Requirements:

English 150	3cr	US Diversity*	3cr
English 250	3cr	Inter. Perspective*	3cr
Library 160	0.5cr		

\* Students may use University Requirements to fill College Requirement. See office or advisor for details.

## College Requirements:

	<b>LAS</b>	<b>AgLS</b>
Foreign Language	8cr <sup>@</sup>	None
Communications	3cr	3cr (verbal required)
Math	Satisfied or exceeded by Biology Major Requirements	
Natural Science	Satisfied or exceeded by Biology Major Requirements	
Arts/Humanities	12cr*	3cr*
Social Science	9cr*	3cr*
Ethics	None	3cr

\* Students may use University Requirements to fill College Requirement. See office or advisor for details.

@ LAS Foreign Language requirement waived with 3 years of a single language in high school

## Biology Major Requirements: 44cr

### Core Program: 23cr

Biology 110	Introduction to Biology [F]	0.5cr
Biology 111	Opportunities in Biology [S]	0.5cr
Biology 211/L	Principles of Biology I	4cr
Biology 212/L	Principles of Biology II	4cr
Biology 312	Ecology	4cr
Biology 313/L	Principles of Genetics	4cr
Biology 314	Molecular & Cellular Bio	3cr
Biology 315	Biological Evolution	3cr

### Advanced Courses: 21cr

- To include:
- 1) 2 BIOL courses with Lab/Field component
  - 2) 1 course from Experiential List [see below ^]
  - 3) 9.0 cr BIOL designator
  - 4) Courses to complete 21.0 credits

## Approved Biology Advanced Courses: (see notes below)

**Biology** \* Designates Lab/Field course. (L\*) indicates lab option may be available. ^ indicates experiential course.

Biol 328	Cell Phys. of Human Disease [F]	3cr	Biol 456 *	Principles of Mycology [F]	3cr
Biol 330 (L*)	Plant Physiology [S]	4-5cr	Biol 457 *	Herpetology [F]	3cr
Biol 335 *	Princ. of Animal Physiology	5cr	Biol 458 *	Ornithology [S]	3cr
Biol 336	Ecol. & Evolutionary Anim. Phys	3cr	Biol 459 *	Mammalogy [S]	3cr
Biol 351 *	Comp Chordate Anatomy [S]	5cr	Biol 462	Evolutionary Genetics [S]	3cr
Biol 352 *	Vertebrate Histology [S]	4cr	Biol 465 *	Morphometric Analysis [S]	4cr
Biol 353 *	Introductory Parasitology [F]	4cr	Biol 471	Intro. Conservation Biology	3cr
Biol 354	Animal Behavior [F]	3cr	Biol 472 *	Community Ecology [S]	3cr
Biol 354L *	Lab in Animal Behavior [F]	1cr	Biol 474	Plant Ecology [S]	3cr
Biol 355	Plants and People [S]	3cr	Biol 476	Functional Ecology [alt S,11]	3cr
Biol 356 *	Dendrology [F]	4cr	Biol 480 ^	Studies in Marine Biol.	1-8cr
Biol 364	Invertebrate Biology [F]	3-4cr	Biol 481 ^	Summer Field Studies	1-8cr
Biol 365 *	Vertebrate Biology [F]	4cr	Biol 482 ^	Tropical Biology	1-4cr
Biol 366 *	Plant Systematics [S]	4cr	Biol 486	Aquatic Ecology	3cr
Biol 371 *	Ecological Methods [S]	3cr	Biol 486L*	Aquatic Ecology Lab	1cr
Biol 381 *	Environmental Systems I [F]	4cr	Biol 487	Aquatic & Wetland Microbial Ecology [S]	3cr
Biol 382 *	Environmental Systems II [S]	4cr	Biol 488 *	ID of Aquatic Organisms	1cr
Biol 393 ^	N. American Field Trips in Biol	1-4cr	Biol 489 *	Population Ecology [F]	3 cr
Biol 394 ^	International Field Trips in Biol	1-4cr	Biol 490 ^	Independent Study (I, R)	1-6cr
Biol 423	Developmental Biology [S]	3cr	Biol 491 ^	Laboratory Teaching Experience	1-2cr
Biol 423L *	Developmental Biol Lab [S]	1cr	Biol 494 ^	Biology Internship	1-3cr
Biol 428	Topics in Cell Biology [S]	3cr	Biol 495 ^	Undergrad Seminar check availability	1-3cr
Biol 434	Gen. Comp. Endocrinology [S]	arr. cr	Biol 498	Cooperative Education	Rcr
Biol 436 (L*)	Neurobiology [F]	3-4cr			
Biol 439	Environmental Physiology	arr. cr			
Biol 444	Intro to Bioinformatics [F]	4cr			
Biol 454 *	Plant Anatomy [F]	4cr			
Biol 455 *	Bryophyte & Lichen Biodivers [S]	3cr			

**Students must take 2 courses with a lab or field component (\*) and at least 9 credits in advanced coursework from BIOL list above.**

Other courses may apply, including 500 level courses from EEOB and GDCB. See advisor.

## Advanced courses from other departments or programs

Courses without specific semester listed may be offered both Fall/Spring [F/S]. Summer session is designated [SS].

Semester offerings change, for specific semesters check schedule of courses

### Agronomy

Agron 421	Introduction to Plant Breeding [F]	3cr
Agron 485	Soil & Environmental Microbiology [F]	3cr

### Animal Science

An S 319	Animal Nutrition	3cr
An S 331	Domestic Animal Reproduction [F,S]	3cr
An S 332	Lab Methods in Animal Repro [F,S]	2cr
An S 333	Embryo Transfer & Rel Technol [F]	2cr
An S 334	Embryo Transfer Laboratory [F]	1cr
An S 337	Lactation [S]	2cr

### Anthropology

Anthr 307	Biological Anthropology [S]	3cr
Anthr 319	Skeletal Biology [alt F, 06]	3cr
Anthr 350	Primate Behavior [F,S,SS]	3cr
Anthr 424	Forensic Anthropology [S]	3cr
Anthr 438	Primate Evolution Ecol. & Behav. [S]	3cr
Anthr 482	Topics in Biological Anthro	3cr

### Biochemistry, Biophysics, Molecular Biology

BBMB 403	Mircobial Biochem & Biotech [alt S, 10]	3cr
BBMB 404	Biochemistry I [F]	3cr
BBMB 405	Biochemistry II [S]	3cr
BBMB 411	Gen Biochem Res Tech Lab [F]	3cr
BBMB 420	Physiological Chemistry [F]	3cr
BBMB 430	Procaryotic Diversity & Ecol [alt S, 11]	3cr
BBMB 440	Lab in Microbial Phys, Diversity & Gen[F]	3cr
BBMB 451	Physical Biochemistry [F]	2cr
BBMB 461	Topics in Biophysics [S]	2cr

### BioMedical Science

BMS 329	Anat and Phys of Domestic Animal [S]	3cr
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### Entomology

Ent 370	Insect Biology [F]	3cr
Ent 374	Insects and Our Health [S]	3cr
Ent 375	Plant Protection ...[alt S, 11]	3cr
Ent 410	Insect-Virus Interactions [alt F, 09]	3cr
Ent 425	Aquatic Insects [alt S, 11]	3cr
Ent 471	Insect Ecology [alt F, 10]	3cr
Ent 478	Molecular Biol of Protozoa [F]	3cr

### Genetics

Gen 340	Human Genetics [alt S, 06]	3cr
Gen 409	Molecular Genetics [F]	3cr
Gen 410	Analytical Genetics [S]	3 cr
Gen 462	Evolutionary Genetics [S]	3cr

### Horticulture

Hort 321	Horticulture Physiology [F]	3cr
Hort 322	Plant Propagation [S]	3cr
Hort 423	Plant Tissue, Cell and Protoplast Culture [alt F, 09]	2cr

### Kinesiology

Kin 355	Biomechanics [F,S]	3cr
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### Microbiology

Micro 302	Biology of Microorganisms [F,S]	3cr
Micro 302L	Microbiology Lab [F,S]	1cr
Micro 310	Medical Microbiology [F]	4cr
Micro 310L	Medical Microbiology Lab [F]	1cr
Micro 320	Microbial Physiol & Gen [S]	4cr
Micro 402	Microbial Genetics [alt F, 10]	3cr
Micro 408	Virology [alt F, 09]	3cr
Micro 420	Food Microbiology [F]	3cr
Micro 475	Immunology [S]	3cr
Micro 475L	Immunology Lab [S]	1cr
Micro 477	Bact-Plant Interactions [alt S, 10]	3cr

### NREM - Animal Ecology, Forestry

A Ecl 321	Fish Biology [S]	3cr
A Ecl 366	Nat Hist of Iowa Vertebrates [S]	3cr
For 302	Silviculture [S]	3cr
NREM 301	Forest Ecology and Soils [F]	3cr
NREM 407	Watershed Management [S]	4cr

### Plant Pathology

PI P 408	Principles of Plant Pathology [F,S]	3cr
PI P 416	Forest Insect and Disease Mgmt [S]	4cr

### Psychology

Psych 310	Brain & Behavior [F,S]	3cr
Psych 315	Drugs & Behavior [F,S]	3cr

**Iowa Lakeside Laboratory** Check 103 Bessey for current offerings. Courses are taught Summer Sessions only at Lakeside Facility, Milford, IA.

**Other courses may apply including special offerings, experimental courses and 500 level courses from these departments.**

**Core and advanced courses must have C- or better to be used.**

## **Biology Major Supporting Sciences Requirements 29- 35cr**

### **Biochemistry and Chemistry** (11 credits minimum)

Students must fulfill the following area requirements:

**General Chemistry 4-9 cr: [Chem 163 and Lab ]or [Chem 177 and Lab + Chem 178 and Lab]\*\***

**Organic Chemistry 4 cr minimum: Chem 231 and Lab or [Chem 331 and Lab + Chem 332 and Lab]\*\***

**Biochemistry 3 cr: BBMB 316X or BBMB 404 or BBMB 420**

**\*\*Students intending to apply to professional or graduate schools should verify admissions requirements regarding supporting sciences.**

The Biology Program suggests the following course plan for Human and Animal Health professions and some graduate programs:  
**Chem 177 and Lab, Chem 178 and Lab, Chem 331 and Lab, Chem 332 and Lab, BBMB 316X or 404 or 420.**

**NOTE: Students who choose to take 2 semesters of Organic Chemistry will exceed the minimum requirement in that area. 332 and Lab will be used as an elective and will not fulfill advanced biology or supporting science requirements. See the Student Services Office, 103 Bessey, for details.**

### **Mathematics** (7-8 credits)

Students must complete one of the following options:

**Calculus and Statistics: Math 160, 181 or 165 + Stat 101 or 104**

**Calculus: Math 181 and 182 or Math 165 and 166**

**Statistics: Stat 101 or 104 + 401**

### **Physical Sciences** (8 credits)

**Physics 111 + 112 (General Physics I and II)**

### **Communication 3cr**

Students must earn a C or better.

One course from the following:

**Sp CM 212 or English 312X (Biological Communications) or 302-316 or JL MC 347**

***Majors in College of Ag and Life Sciences must take SP CM 212***

### **Important Information:**

Choose your advanced coursework in biology to meet your professional goals.

**Students planning for professional schools (Human Med, Vet, PT, PA, Dent, Opt, Nursing etc) should consult the program or programs they intend to apply to for requirements regarding Chemistry, Math, Physics and Biology (Human Anatomy and Physiology). Other Non-Science courses may be required at some institutions.**

**Students may be required to take Biol 255/L and 256/L to meet Human Anatomy and Physiology for some professional schools. These courses will not meet Advanced Biology credit requirements and would have to be taken as electives.**

Students may use a maximum of 7 credits toward advanced biology requirements from the following list (no more than 6cr in each course may apply): Biol 393, 394, 480, 481, 490, 491, 494, 495, 498.

For information regarding courses in advanced biology available at field stations or other universities see your advisor or the Student Services Office, 103 Bessey.

Credits toward advanced biology may be obtained during a study abroad or exchange. Planning is critical. See your advisor at least 1 semester prior to the experience.

Other 300, 400 and 500 level courses from GDCB, EEOB or the departments listed above may be considered for use in advanced biology.

Students in Biology must have a minimum C average (2.0) in the major (Biological Sciences coursework) to graduate.

The English proficiency requirement for Biology is a C or better in English 150, 250 and either a writing course or verbal communications course.

Minimum graduation requirements for a biology degree from Iowa State University include the following:

Minimum of 120 credits

Cumulative and major GPA above or equal to 2.0

The final 32 credits must be taken at ISU or approved by advisor and/or college.

The LAS College requires 45 credits of 300+ level course work from a 4 yr college.

Courses taken Pass/NotPass (P/NP) cannot be used to meet area requirements or major/ minor requirements and may only be used toward the graduation total credit requirement (120) as electives. P/NP courses cannot be repeated for credit or grade.

A minimum of 32 ISU credits (of the 120) are required to graduate from ISU.

Courses taken at other institutions may be deemed equivalent to ISU courses or may be substituted by the Biology Program to fulfill requirements. Other courses may not be deemed equivalent or may not meet substitution standards and may be placed in general electives.