

# INTEGRATIVE BIOLOGY, BSLAS

for the degree of Bachelor of Science in Liberal Arts & Sciences Major in Integrative Biology

In the **School of Integrative Biology (SIB)**, students receive interdisciplinary training to prepare them for 21st-century scientific roles. We occupy a unique position on campus. Our majors explore how scales of life interact, from molecules through global cycles, to solve grand challenges such as addressing global change, improving human health, mitigating biodiversity loss, and contributing to ecosystem restoration and sustainable food and biofuel production. The SIB community collaborates extensively on both research and teaching, leading to multi-disciplinary courses grounded in active learning and highly transferable, higher-order processing skills such as application, interpretation, and evaluation. Students build laboratory skills spanning from tall grass prairie restoration to modern genome-editing techniques. The IB curriculum includes preparation in genomics and evolution; comparative anatomy, physiology, and development; ecology and behavior; phylogenetic systematics and molecular biology; and mathematical modeling and informatics. Graduates are well-equipped for a broad range of careers in fields including healthcare, biotechnology, genetic counseling, wildlife management, and environmental sciences.

For students interested in the 5-year, combined BSLAS & MS in Integrative Biology program visit the Integrative Biology, BSLAS-MS catalog page (<http://catalog.illinois.edu/undergraduate/las/integrative-biology-bslas-ms/>).

For students interested in adding educational licensure to the BSLAS in Integrative Biology, visit the Teacher Education Minor in Secondary School Teaching catalog page (<http://catalog.illinois.edu/undergraduate/education/minors/teacher-education-secondary-school/>).

Students pursuing a degree in Integrative Biology will not be allowed to double major in Molecular and Cellular Biology.

## Distinction for Excellence in Research

Students are eligible for graduation at the following levels: Distinction, High Distinction, or Highest Distinction. Distinction will be determined by the SIB Distinction Committee and the level of Distinction will be based on the information below. To be eligible for graduation with Distinction for Excellence in Research a student must:

- Be enrolled as an Integrative Biology or Integrative Biology Honors major
- Have a completed distinction evaluation form submitted by their Faculty Research Advisor
- Maintain a minimum 3.25 GPA within the major at the end of the penultimate semester
- To be eligible for Distinction, students must give a poster presentation at the SIB Distinction Symposium or other approved venue
- To be eligible for High or Highest Distinction, students must submit a written thesis and give an oral presentation at the SIB Distinction Symposium or other approved venue
- Finally, all students regardless of Distinction level must either:

1. Complete two or more semesters of IB 390/IB 490 for 2-credit hours or more each semester. The student should enroll in IB 490 the semester they intend to graduate, which counts towards the two required semesters.

OR

2. Complete at least 180 hours of mentored research. The research experience must last a minimum of 20 weeks (the weeks need not be consecutive and summer research counts toward this total) and students should enroll in one semester of IB 490 for a minimum of 1-credit hour prior to or during the semester they intend to graduate. Example: a student could be eligible if they complete a 10-week summer research experience combined with enrolling in IB 490 the following spring semester, the same term they intend to graduate.

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### Graduation Requirements

Minimum hours required for graduation: 120 hours.

Minimum required major and supporting course work: Normally equates to 66-75 hours.

### University Requirements

Minimum of 40 hours of upper-division coursework, generally at the 300- or 400-level. These hours can be drawn from all elements of the degree. Students should consult their academic advisor for additional guidance in fulfilling this requirement.

The university and residency requirements can be found in the Student Code (<https://studentcode.illinois.edu/article3/part8/3-801/>) (§ 3-801) and in the Academic Catalog (<http://catalog.illinois.edu/general-information/degree-general-education-requirements/>).

### General Education Requirements

Follows the campus General Education (Gen Ed) requirements (<https://courses.illinois.edu/gened/DEFAULT/DEFAULT/>). Some Gen Ed requirements may be met by courses required and/or electives in the program.

Code	Title	Hours
Composition I		4-6
Advanced Composition		3
	fulfilled by IB 203	
Humanities & the Arts (6 hours)		6
Natural Sciences & Technology (6 hours)		6
	fulfilled by CHEM 102 and CHEM 104, or CHEM 202 and CHEM 204; PHYS 101 and PHYS 102, or PHYS 211 and PHYS 212; IB 150, MCB 150	
Social & Behavioral Sciences (6 hours)		6
Cultural Studies: Non-Western Cultures (1 course)		3
Cultural Studies: US Minority Cultures (1 course)		3
Cultural Studies: Western/Comparative Cultures (1 course)		3
Quantitative Reasoning (2 courses, at least one course must be Quantitative Reasoning I)		6-10

fulfilled by MATH 220 or MATH 221; STAT 212; PHYS 101 and PHYS 102, or PHYS 211 and PHYS 212		
Language Requirement (Completion of the fourth semester or equivalent of a language other than English is required)	0-20	
<b>Code</b>	<b>Title</b>	<b>Hours</b>
<b>Orientation and Professional Development</b>		
LAS 101	Design Your First Year Experience	1
OR		
LAS 100 & LAS 101	Success in LAS for International Students and Design Your First Year Experience	3
OR		
LAS 102	Transfer Advantage	1
<b>Total Hours</b>		<b>1 or 3</b>
<b>Code</b>	<b>Title</b>	<b>Hours</b>
<b>Major Core Requirements and Electives</b>		
IB 150	Organismal & Evolutionary Biol	4
MCB 150	Molec & Cellular Basis of Life	4
MATH 220	Calculus (sections that start with 'X' are strongly recommended)	4-5
or MATH 221	Calculus I	
Select one group of courses:		8-10
CHEM 102	General Chemistry I	
CHEM 103	General Chemistry Lab I	
CHEM 104	General Chemistry II	
CHEM 105	General Chemistry Lab II	
or		
CHEM 202	Accelerated Chemistry I	
CHEM 203	Accelerated Chemistry Lab I	
CHEM 204	Accelerated Chemistry II	
CHEM 205	Accelerated Chemistry Lab II	
Select one group of courses:		5-6
CHEM 232 & CHEM 233	Elementary Organic Chemistry I and Elementary Organic Chem Lab I	
CHEM 236 & CHEM 237	Fundamental Organic Chem I and Structure and Synthesis	
Select one group of courses:		8-10
PHYS 101 & PHYS 102	College Physics: Mech & Heat and College Physics: E&M & Modern	
PHYS 211 & PHYS 212	University Physics: Mechanics and University Physics: Elec & Mag	
<b>Note: An optional IB Honors concentration may be elected, please talk to an advisor. Students who do not elect an optional concentration are required to take the IB major coursework below.</b>		
STAT 212	Biostatistics	3
IB 202	Physiology (IB 202 requires animal dissection and no equivalent alternative is available. IB majors are required to enroll in the 4-hour version of this course.)	4
IB 203	Ecology	4
IB 204	Genetics (IB majors are required to enroll in the 4-hour version of IB 204.)	4
IB 302	Evolution	4

Advanced Free Elective (300- or 400-level course from IB or any other unit on campus) 3

Integrative Biology Advanced Area Courses 15-20

**At least two courses from the following areas. At least one course must be a lab and the courses must be in different areas.**

**Area I: Organismal and Evolutionary Biology**

IB 360 Evolution and Human Health

IB 362 Marine Biology

IB 368 Vertebrate Natural History (lab)

IB 401 Introduction to Entomology (lab)

IB 407 Plant Diversity and Evolution (lab)

IB 461 Ornithology (lab)

IB 462 Mammalogy (lab)

IB 463 Ichthyology (lab)

IB 464 Herpetology (lab)

IB 468 Insect Classification and Evol (lab)

IB 471 Fungal Diversity and Ecology (lab)

**Area II: Behavior, Ecology, and the Environment**

IB 329 Animal Behavior

IB 361 Ecology and Human Health

IB 405 Evolution of Traits and Genomes

IB 430 Animal Behavior Lab (lab)

IB 431 Behavioral Ecology

IB 432 Genes and Behavior

IB 439 Biogeography

IB 440 Plants and Global Change

IB 444 Insect Ecology (lab)

IB 451 Conservation Biology (lab)

IB 452 Ecosystem Ecology

IB 453 Community Ecology

IB 481 Vector-borne Diseases (lab)

IB 482 Insect Pest Management (lab)

IB 494 Theoretical Biology + Models (lab)

**Area III: Integrative Anatomy, Physiology, and Molecular Biology**

IB 303 Anatomy (lab)

IB 364 Genomics and Human Health

IB 411 Bioinspiration

IB 420 Plant Physiology

IB 421 Photosynthesis

IB 426 Env and Evol Physl of Animals

IB 433 Insect Physiology

IB 435 Critical Evaluation of Herbal Remedies

IB 438 How Organisms Move (lab)

IB 460 Evol of Intelligent Systems (lab)

IB 465 Methods in Molecular Genetics and Genomics

**Remaining courses to total 15 hours minimum may be selected from any of the area courses listed above or from the following list:**

IB 348 Fish and Wildlife Ecology

IB 392	Translating Your IB Degree Into Career Success
IB 416	Population Genetics
IB 436	Evolutionary Neuroscience
IB 442	Evolution of Infectious Disease
IB 450	Stream Ecology
IB 467	Principles of Systematics
IB 476	Environmental Remote Sensing
IB 478	Advanced Plant Genetics
IB 479	Plant Growth and Development
IB 480	Bioinspired Design
IB 484	Paleoclimatology
IB 491	Biological Modeling
IB 496	Special Courses
IB 497	Science Communication
IB 499	Discussions in Integrative Biology
MCB 300	Microbiology
MCB 314	Introduction to Neurobiology
MCB 450	Introductory Biochemistry

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## Sample Sequence

This sample sequence is intended to be used only as a guide for degree completion. All students should work individually with their academic advisors to decide the actual course selection and sequence that works best for them based on their academic preparation and goals. Enrichment programming such as study abroad, minors, internships, and so on may impact the structure of this four-year plan. Course availability is not guaranteed during the semester indicated in the sample sequence.

Students must fulfill their Language Other Than English requirement by successfully completing a fourth level of a language other than English. For more information, see the corresponding section on the Degree and General Education Requirements page (<http://catalog.illinois.edu/general-information/degree-general-education-requirements/>).

### First Year

First Semester	Hours	Second Semester	Hours
LAS 101	4	1 MCB 150	4
IB 150	3	4 CHEM 104 (or CHEM 204)	3
CHEM 102 (or CHEM 202)	1	3 CHEM 105 (or CHEM 205)	1
CHEM 103 (or CHEM 203)	4	1 Language Other than English (4th level)	4
Language Other than English (3rd level)	5-4	4 MATH 220 (or MATH 221) or Composition I	
Composition I or MATH 220 (or MATH 221)	4-5		
	17		17

### Second Year

First Semester	Hours	Second Semester	Hours
IB 203	4	IB 202	4
IB 204	4	IB 302	4
CHEM 232 (or CHEM 236)	2	4 CHEM 233 (or CHEM 237)	2
General Education course	3	STAT 212	3
	15		13

### Third Year

First Semester	Hours	Second Semester	Hours
Advanced IB course	3	Advanced IB Course	4
PHYS 101 (or PHYS 211)	5	PHYS 102 (or PHYS 212)	5
General Education course	3	General Education course	3
General Education course	3	General Education course	3
	14		15

### Fourth Year

First Semester	Hours	Second Semester	Hours
Advanced IB Course	4	Advanced IB Course	4
Advanced IB Course	3	General Education course	3
General Education course	3	Free elective course	3
Free elective course	3	Free elective course	3
Free elective course	3		
	16		13

### Total Hours 120

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By the time they graduate, an Integrative Biology major should be able to:

1. Synthesize and apply core knowledge in Integrative Biology, including anatomy, development, ecology, evolution, genetics, molecular biology, physiology, and/or systematics.
2. Apply predictive models to biological phenomena and engage with the process of scientific inquiry.
3. Critically evaluate and communicate complex, dynamic scientific information.
4. Employ curiosity, inquiry, quantitative reasoning, and critical thinking in problem solving.
5. Create solutions for global and local biological challenges using interdisciplinary strategies.
6. Develop professional skills including ethics, proficiency in oral and written scientific communication, data analysis and interpretation,

collaboration, and the ability to critically evaluate science-related news and information.

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## School of Integrative Biology

School of Integrative Biology website (<http://sib.illinois.edu/>)

School of Integrative Biology faculty (<https://sib.illinois.edu/directory/faculty/>)

## Advising

SIB Advising website (<https://sib.illinois.edu/academics/undergraduate-programs/>)

[advising@sib.illinois.edu](mailto:advising@sib.illinois.edu)

## College of Liberal Arts and Sciences

College of Liberal Arts and Sciences website (<https://las.illinois.edu/>)

## Admissions

University of Illinois Undergrad Admissions (<https://www.admissions.illinois.edu/>)