

# Integrative Biology

## Bachelor of Arts (BA)

Students who major in Integrative Biology (IB) will gain a broad and deep knowledge in the biological sciences as well as an excellent foundation in the biology of organisms, populations, and communities. This program may be of particular interest to students who wish to pursue graduate studies in any of these subdisciplines or related emerging research areas. It also provides superb training for students interested in health-related professions (medicine, dentistry, veterinary medicine, physical therapy, nursing, pharmacy, optometry, etc.) or allied careers in biology (psychology, sociobiology, forestry, wildlife conservation, environmental and resource management, law, etc.).

The department's broad range of experts includes behaviorists, ecologists, evolutionary biologists, geneticists, morphologists, paleontologists, physiologists, and systematists.

## Course of Study Overview

Students majoring in Integrative Biology choose one of two tracks: Ecology, Evolution and Organismal Biology (Track 1) or Human Biology and Health Sciences (Track 2). The lower division requirements are the same for all IB majors, regardless of the track. The upper division requirements differ for the two tracks. For detailed information, please see the Major Requirements tab (<http://guide.berkeley.edu/archive/2017-18/undergraduate/degree-programs/integrative-biology/#majorrequirementstext>).

## Declaring the Major

In order to declare Integrative Biology as a major, students must have completed certain prerequisites. For information regarding these courses, please see the Major Requirements tab (<http://guide.berkeley.edu/archive/2017-18/undergraduate/degree-programs/integrative-biology/#majorrequirementstext>). The grade point averages (GPA) in (1.) courses for the major and (2.) any upper-division major requirements must each be at least 2.0. All declaring students must meet with a staff adviser and a faculty adviser as part of the declaration process.

At the time of declaration, students must have completed:

- One year of calculus, either MATH 1A and MATH 1B or MATH 10A and MATH 10B
- CHEM 1A and CHEM 1AL
- CHEM 3A
- Either BIOLOGY 1A and BIOLOGY 1AL or BIOLOGY 1B

AND be enrolled in or have completed:

- Either CHEM 3B or the second biology course (see above) and receive an average grade or better on the midterm exam
- Either INTEGBI 77A or INTEGBI 77B

For transfer students, it is recommended that lower division courses be completed before arriving at Berkeley. Before declaring, transfer students should have completed at least one semester at Berkeley, with a GPA of at least 2.0 in all courses taken for the major, and they should have completed all lower division courses except the Physics series.

For detailed instructions on the process for declaring the major, please see the department's website (<http://ib.berkeley.edu/undergrad/major/declaring.php>).

## Honors Program

Students with minimum grade point averages (GPA) of 3.3 overall, in the major, and in all upper-division major requirements are encouraged to participate in the honors program. Interested students must identify an appropriate faculty sponsor who agrees to advise them on an original research project and enroll in two consecutive semesters of the honors thesis course (INTEGBI H196A and INTEGBI H196B). Honors students must present the results of their work in the form of a written honors thesis and a poster presentation at Cal Day. In order to graduate with honors, students must maintain the minimum required GPAs.

## Minor Program

There is no minor program in Integrative Biology.

In addition to the university, campus, and college requirements, listed on the College Requirements tab (<http://guide.berkeley.edu/archive/2017-18/undergraduate/degree-programs/integrative-biology/#collegerequirementstext>), students must fulfill the below requirements specific to their major program.

## General Guidelines

1. All courses taken to fulfill the major requirements below must be taken for letter-graded credit.
2. Standardized test credit (e.g., Advanced Placement) cannot be used to satisfy any major requirements.
3. No more than one upper division course may be used to simultaneously fulfill requirements for a student's major and minor programs, with the exception of minors offered outside of the College of Letters & Science. Double majors and simultaneous degrees are limited to a two course overlap.
4. Students must maintain a minimum grade point average (GPA) of at least a 2.0 GPA overall, a 2.0 GPA in the required major coursework (lower and upper division), and a 2.0 GPA in the upper division coursework for the major.
5. A maximum of two elective courses may be taken from outside of the Department of Integrative Biology. This includes study abroad courses, as well as non-IB courses, even if they are on the approved electives list.

For information regarding breadth, residence, requirements and unit requirements, please see the College Requirements tab (<http://guide.berkeley.edu/archive/2017-18/undergraduate/degree-programs/integrative-biology/#collegerequirementstext>).

## Lower Division Requirements, Both Tracks

### Calculus Series (choose one)

MATH 1A & MATH 1B	Calculus and Calculus	8
MATH 10A & MATH 10B	Methods of Mathematics: Calculus, Statistics, and Combinatorics and Methods of Mathematics: Calculus, Statistics, and Combinatorics	8

### Other Lower Division Requirements

CHEM 1A & 1AL	General Chemistry and General Chemistry Laboratory <sup>1</sup>	4
------------------	--	---

CHEM 3A & 3AL	Chemical Structure and Reactivity and Organic Chemistry Laboratory	5
CHEM 3B & 3BL	Chemical Structure and Reactivity and Organic Chemistry Laboratory	5
BIOLOGY 1A & 1AL	General Biology Lecture and General Biology Laboratory	5
BIOLOGY 1B	General Biology Lecture and Laboratory	4
PHYSICS 8A	Introductory Physics <sup>2</sup>	4
PHYSICS 8B	Introductory Physics <sup>2</sup>	4
INTEGBI 77A or INTEGBI 77B	Integrative Human Biology <sup>3</sup>	1

<sup>1</sup> CHEM 4A can be substituted for Chem 1A/1AL.

<sup>2</sup> PHYSICS 7A & PHYSICS 7B can be substituted for these courses.

<sup>3</sup> Students declaring IB in Fall 2017 or later must take either INTEGBI 77A or INTEGBI 77B; only one is required.

## Upper Division Requirements, Track 1: Ecology, Evolution, and Organismal Biology (24 units minimum)

### Group Requirements (see lists below)

One course from Group A: Evolution and Genetics

Two courses from Group B: Ecology, Behavior, and Diversity

One course from Group C: Structure, Function, and Human Health

Two upper division lab courses; one must be field-based (LF)

### Electives

Select additional approved courses, as needed, from the group, lab, and elective lists to total at least 24 upper division units.

### Optional: Research or Honors

Up to 3 units of research credit in INTEGBI 191, INTEGBI H196A, or INTEGBI H196B

## Upper Division Requirements, Track 2: Human Biology and Health Sciences (24 units minimum)

### Group Requirements (see lists below)

One course from Group A: Evolution and Genetics

One course from Group B: Ecology, Behavior, and Diversity

Two courses from Group C: Structure, Function, and Human Health.

One must be INTEGBI 131 or INTEGBI 132.

Two upper division lab courses

### Electives

Select additional approved courses, as needed, from the group, lab, and elective lists to total at least 24 upper division units.

### Optional: Research or Honors

Up to 3 units of research credit in INTEGBI 191, INTEGBI H196A, or INTEGBI H196B

## Requirement Group A: Evolution and Genetics

INTEGBI 141	Human Genetics	3
INTEGBI 160	Evolution	4
INTEGBI 161	Population and Evolutionary Genetics	4
INTEGBI 162	Ecological Genetics	4

INTEGBI 163	Molecular and Genomic Evolution	3
INTEGBI 164	Human Genetics and Genomics	4
INTEGBI 167	Evolution and Earth History: From Genes to Fossils	4
INTEGBI 169	Evolutionary Medicine	4
INTEGBI 172	Coevolution: From Genes to Ecosystems	4

## Requirement Group B: Ecology, Behavior, and Diversity

INTEGBI 102LF	Introduction to California Plant Life with Laboratory <sup>++</sup>	4
INTEGBI 103LF	Invertebrate Zoology with Laboratory <sup>++</sup>	5
INTEGBI 104LF	Natural History of the Vertebrates with Laboratory <sup>++</sup>	5
INTEGBI/PLANTBI C107L	Principles of Plant Morphology with Laboratory <sup>++</sup>	4
INTEGBI/PLANTBI C110L	Biology of Fungi with Laboratory <sup>++</sup>	4
INTEGBI 113L	Paleobiological Perspectives on Ecology and Evolution <sup>++</sup>	4
INTEGBI 114	Infectious Disease Dynamics	4
INTEGBI C144/ESPM C126	Animal Behavior	4
INTEGBI 146LF	Behavioral Ecology with Laboratory <sup>++</sup>	5
INTEGBI 151	Plant Physiological Ecology	4
INTEGBI 152	Environmental Toxicology	4
INTEGBI 153	Ecology	3
INTEGBI 154	Plant Ecology	3
INTEGBI C155/ANTHRO C129D	Holocene Paleoecology: How Humans Changed the Earth	3
INTEGBI C156/ESPM C103	Principles of Conservation Biology	4
INTEGBI 157LF	Ecosystems of California <sup>++</sup>	4
INTEGBI 158LF/ESPM C107	Biology and Geomorphology of Tropical Islands <sup>++</sup>	13
INTEGBI 159	The Living Planet: Impact of the Biosphere on the Earth System	3
INTEGBI 162	Ecological Genetics	4
INTEGBI 166	Course Not Available	4
INTEGBI 167	Evolution and Earth History: From Genes to Fossils	4
INTEGBI 168L	Systematics of Vascular Plants with Laboratory <sup>++</sup>	4
INTEGBI 170LF	Methods in Population and Community Ecology <sup>++</sup>	3
INTEGBI C171	Freshwater Ecology	3
INTEGBI 173LF	Mammalogy with Laboratory <sup>++</sup>	5
INTEGBI 174LF	Ornithology with Laboratory <sup>++</sup>	4
INTEGBI 175LF	Herpetology with Laboratory <sup>++</sup>	4
INTEGBI C176L	Fish Ecology <sup>++</sup>	3
INTEGBI 181L	Paleobotany - The 500-Million Year History of a Greening Planet <sup>++</sup>	4
INTEGBI 183L	Evolution of the Vertebrates with Laboratory <sup>++</sup>	4
INTEGBI C185L/ANTHRO C100	Human Paleontology <sup>++</sup>	5

INTEGBI C187/ ANTHRO C124C	Human Biogeography of the Pacific	3
-------------------------------	-----------------------------------	---

++ These courses can be used to fulfill one group AND one lab requirement.

## Requirement Group C: Structure, Function, and Human Health

INTEGBI 114	Infectious Disease Dynamics	4
INTEGBI 115	Introduction to Systems in Biology and Medicine	4
INTEGBI 116L	Medical Parasitology ++	4
INTEGBI 117	Medical Ethnobotany	2
INTEGBI 118	Host-Microbe Interactions	4
INTEGBI 123AL	Exercise and Environmental Physiology with Laboratory ++	5
INTEGBI C125L/ PHYS ED C165	Introduction to the Biomechanical Analysis of Human Movement ++	4
INTEGBI 128	Sports Medicine	3
INTEGBI C129L/ PHYS ED C129	Human Physiological Assessment ++	3
INTEGBI 131	General Human Anatomy	3
INTEGBI 132	Survey of Human Physiology	4
INTEGBI 135	The Mechanics of Organisms	4
INTEGBI 136	The Biology of Sex	4
INTEGBI 137	Human Endocrinology	4
INTEGBI 138	Comparative Endocrinology	4
INTEGBI 139	The Neurobiology of Stress	4
INTEGBI 140	Biology of Human Reproduction	4
INTEGBI C142L/ ANTHRO C103	Introduction to Human Osteology ++	6
INTEGBI C143A/ PSYCH C113	Biological Clocks: Physiology and Behavior	3
INTEGBI C143B/ PSYCH C116	Hormones and Behavior	3
INTEGBI 148	Comparative Animal Physiology	3
INTEGBI 150	Evolutionary Environmental Physiology	3
INTEGBI 151	Plant Physiological Ecology	4
INTEGBI 184L	Morphology of the Vertebrate Skeleton with Laboratory ++	4

++ These courses can be used to fulfill one group AND one lab requirement.

## Approved Lab and Field-Lab (LF) Courses

INTEGBI 102LF	Introduction to California Plant Life with Laboratory ++	4
INTEGBI 103LF	Invertebrate Zoology with Laboratory ++	5
INTEGBI 104LF	Natural History of the Vertebrates with Laboratory ++	5
INTEGBI/ PLANTBI C107L	Principles of Plant Morphology with Laboratory ++	4
INTEGBI C110L	Biology of Fungi with Laboratory ++	4
INTEGBI 113L	Paleobiological Perspectives on Ecology and Evolution ++	4
INTEGBI 116L	Medical Parasitology ++	4

INTEGBI 117LF	Medical Ethnobotany Laboratory	2
INTEGBI 123AL	Exercise and Environmental Physiology with Laboratory ++	5
INTEGBI C125L/ PHYS ED C165	Introduction to the Biomechanical Analysis of Human Movement ++	4
INTEGBI C129L/ PHYS ED C129	Human Physiological Assessment ++	3
INTEGBI 131L	General Human Anatomy Laboratory	2
INTEGBI 132L	Mammalian Physiology Laboratory	2
INTEGBI C135L/ EL ENG C145O/ BIO ENG C136L	Laboratory in the Mechanics of Organisms	3
INTEGBI C142L/ ANTHRO C103	Introduction to Human Osteology ++	6
INTEGBI 146LF	Behavioral Ecology with Laboratory ++	5
INTEGBI 151L	Plant Physiological Ecology Laboratory	2
INTEGBI 154L	Plant Ecology Laboratory	2
INTEGBI 157LF	Ecosystems of California ++	4
INTEGBI 158LF/ ESPM C107	Biology and Geomorphology of Tropical Islands ++	13
INTEGBI 168L	Systematics of Vascular Plants with Laboratory ++	4
INTEGBI 170LF	Methods in Population and Community Ecology ++	3
INTEGBI 173LF/ ESPM C107	Mammalogy with Laboratory ++	5
INTEGBI 174LF	Ornithology with Laboratory ++	4
INTEGBI 175LF	Herpetology with Laboratory ++	4
INTEGBI C176L/ ESPM C115C	Fish Ecology ++	3
INTEGBI 181L	Paleobotany - The 500-Million Year History of a Greening Planet ++	4
INTEGBI 183L	Evolution of the Vertebrates with Laboratory ++	4
INTEGBI 184L	Morphology of the Vertebrate Skeleton with Laboratory ++	4
INTEGBI C185L/ ANTHRO C100	Human Paleontology ++	5

++ These courses can be used to fulfill one group AND one lab requirement.

Undergraduate students in the College of Letters & Science must fulfill the following requirements in addition to those required by their major program.

For detailed lists of courses that fulfill college requirements, please review the College of Letters & Sciences (<http://guide.berkeley.edu/archive/2017-18/undergraduate/colleges-schools/letters-science>) page in this Guide.

## Entry Level Writing (<http://writing.berkeley.edu/node/78>)

All students who will enter the University of California as freshmen must demonstrate their command of the English language by fulfilling the Entry Level Writing requirement. Fulfillment of this requirement is also a prerequisite to enrollment in all reading and composition courses at UC Berkeley.

## American History and American Institutions (<http://guide.berkeley.edu/archive/2017-18/undergraduate/colleges-schools/letters-science/american-history-institutions-requirement>)

The American History and Institutions requirements are based on the principle that a US resident graduated from an American university, should have an understanding of the history and governmental institutions of the United States.

## American Cultures (<http://americancultures.berkeley.edu/students/courses>)

American Cultures is the one requirement that all undergraduate students at Cal need to take and pass in order to graduate. The requirement offers an exciting intellectual environment centered on the study of race, ethnicity and culture of the United States. AC courses offer students opportunities to be part of research-led, highly accomplished teaching environments, grappling with the complexity of American Culture.

## Quantitative Reasoning

The Quantitative Reasoning requirement is designed to ensure that students graduate with basic understanding and competency in math, statistics, or computer science. The requirement may be satisfied by exam or by taking an approved course.

## Foreign Language

The Foreign Language requirement may be satisfied by demonstrating proficiency in reading comprehension, writing, and conversation in a foreign language equivalent to the second semester college level, either by passing an exam or by completing approved course work.

## Reading and Composition

In order to provide a solid foundation in reading, writing, and critical thinking the College requires two semesters of lower division work in composition in sequence. Students must complete a first-level reading and composition course by the end of their second semester and a second-level course by the end of their fourth semester.

## Breadth Requirements

The undergraduate breadth requirements provide Berkeley students with a rich and varied educational experience outside of their major program. As the foundation of a liberal arts education, breadth courses give students a view into the intellectual life of the University while introducing them to a multitude of perspectives and approaches to research and scholarship. Engaging students in new disciplines and with peers from other majors, the breadth experience strengthens interdisciplinary connections and context that prepares Berkeley graduates to understand and solve the complex issues of their day.

## Unit Requirements

- 120 total units, including at least 60 L&S units
- Of the 120 units, 36 must be upper division units
- Of the 36 upper division units, 6 must be taken in courses offered outside your major department

## Residence Requirements

For units to be considered in "residence," you must be registered in courses on the Berkeley campus as a student in the College of Letters & Science. Most students automatically fulfill the residence requirement by attending classes here for four years. In general, there is no need to be concerned about this requirement, unless you go abroad for a semester or year or want to take courses at another institution or through UC Extension during your senior year. In these cases, you should make an appointment to meet an adviser to determine how you can meet the Senior Residence Requirement.

Note: Courses taken through UC Extension do not count toward residence.

## Senior Residence Requirement

After you become a senior (with 90 semester units earned toward your BA degree), you must complete at least 24 of the remaining 30 units in residence in at least two semesters. To count as residence, a semester must consist of at least 6 passed units. Inter-campus Visitor, EAP, and UC Berkeley-Washington Program (UCDC) units are excluded.

You may use a Berkeley Summer Session to satisfy one semester of the Senior Residence requirement, provided that you successfully complete 6 units of course work in the Summer Session and that you have been enrolled previously in the college.

## Modified Senior Residence Requirement

Participants in the UC Education Abroad Program (EAP) or the UC Berkeley Washington Program (UCDC) may meet a Modified Senior Residence requirement by completing 24 (excluding EAP) of their final 60 semester units in residence. At least 12 of these 24 units must be completed after you have completed 90 units.

## Upper Division Residence Requirement

You must complete in residence a minimum of 18 units of upper division courses (excluding EAP units), 12 of which must satisfy the requirements for your major.

The sample plans below show a four-year plan for completing the major in Integrative Biology, taking classes only during fall and spring semesters. All of the lower division classes are offered during the summer as well. Please consult the sample plan appropriate to your track. Peer and academic advisers are available to help customize a plan to the student's specific situation.

**Please note that the sample plans below include only courses required for the major.** For more detailed information regarding other requirements, including unit minimums per semester, Letters & Science Breadth requirements, Reading and Composition (R & C), and the American Cultures (AC) requirements, please see the College Requirements tab (<http://guide.berkeley.edu/archive/2017-18/undergraduate/degree-programs/integrative-biology/#collegerequirementstext>).

## Sample 4-Year Plan, Track 1: Ecology, Evolution, and Organismal Biology

	Fall	Units	Spring	Freshman
				Units
MATH 10A or 1A		4	MATH 10B or 1B	4

CHEM 1A & 1AL	4	CHEM 3A & 3AL	5	
INTEGBI 77A (Only one of INTEGBI 77A or 77B is required)	1	INTEGBI 77B (Only one of INTEGBI 77A or 77B is required)	1	
	9		10	
				<b>Sophomore</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
CHEM 3B & 3BL		5	BIOLOGY 1A & 1AL	5
BIOLOGY 1B		4	PHYSICS 8A	4
		9		9
				<b>Junior</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
IB Requirement: Group A		3-4	IB Requirement: Group B w/ field lab	4-5
PHYSICS 8B		4	IB Requirement: Elective	3-5
		7-8		7-10
				<b>Senior</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
IB Requirement: Group B		3-5	IB Requirement: Elective	4-5
IB Requirement: Group C with Lab		4-6	IB Requirement: Elective	3-5
		7-11		7-10
<b>Total Units: 65-76</b>				

## Sample 4-Year Plan, Track 2: Human Biology and Health Sciences

				<b>Freshman</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
MATH 10A or 1A		4	MATH 10B or 1B	4
CHEM 1A & 1AL		4	CHEM 3A & 3AL	5
INTEGBI 77A (Only one of INTEGBI 77A or 77B is required)		1	INTEGBI 77B (Only one of INTEGBI 77A or 77B is required)	1
		9		10
				<b>Sophomore</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
CHEM 3B & 3BL		5	BIOLOGY 1B	4
PHYSICS 8A		4	PHYSICS 8B	4
		9		8
				<b>Junior</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
IB Requirement: Group C		3-5	IB Requirement: Group A	3-4
BIOLOGY 1A & 1AL		5	IB Requirement: Group B	3-5

				<b>Freshman</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
IB Requirement: Elective		4-5	IB Requirement: Lab	2-5
IB Requirement: Group C with Lab		3-5	IB Requirement: Elective	3-5
		7-10		5-10
<b>Total Units: 65-79</b>				

## Sample 4-Year Plan, Spring Start

				<b>Freshman</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
MATH 10A or 1A		4	MATH 10B or 1B	4
			CHEM 1A & 1AL	4
			INTEGBI 77B (Only one of INTEGBI 77A or 77B is required)	1
		4		9
				<b>Sophomore</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
CHEM 3A & 3AL		5	CHEM 3B & 3BL	5
BIOLOGY 1B		4	PHYSICS 8A	4
INTEGBI 77A (Only one of INTEGBI 77A or 77B is required)		1		
		10		9
				<b>Junior</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
BIOLOGY 1A & 1AL		5	IB Requirement: Group B	3-5
PHYSICS 8B		4	IB Requirement: Elective	3-4
		9		6-9
				<b>Senior</b>
	<b>Fall</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
IB Requirement: Group A		3-4	IB Requirement: Lab or Field Lab	2-5
IB Requirement: Group C with Lab		4-5	IB Requirement: Group B or C	3-5
IB Requirement: Elective		3-5	IB Requirement: Elective	3-5
		10-14		8-15
<b>Total Units: 65-79</b>				

## Sample 4-Year Plan, Transfer Students

It is highly recommended for transfer students to complete all lower division coursework before enrolling at UC Berkeley.



	Fall	Units	Spring	Junior Units
IB Group C w/lab		4-5 IB Group B (with Field Lab if Track 1)		3-5
IB Group B or Elective		3-5 IB Group C or Elective		2-5
INTEGBI 77A (Only one of INTEGBI 77A or 77B is required)		1 INTEGBI 77B (Only one of INTEGBI 77A or 77B is required)		1
		<b>8-11</b>		<b>6-11</b>
	Fall	Units	Spring	Senior Units
IB Group A		3-4 IB Elective		4-5
IB Elective		3-5 IB Lab (if track 2)		2-4
		<b>6-9</b>		<b>6-9</b>
<b>Total Units: 26-40</b>				

## Accelerated Program Plans

For students considering graduating in less than four years, it's important to acknowledge the reasons to undertake such a plan of study. While there are advantages to pursuing a three-year degree plan, such as reducing financial burdens, they can significantly restrict participation in co-curricular activities, depth of study, and research internships. Please consult with an academic adviser before pursuing an accelerated degree plan.

## Learning Goals for the Major

1. Describe the principles of evolution and genetics that underlie all biology.
2. Demonstrate a broad and integrated understanding of species origins, biological and organismal diversity, how to characterize, understand and protect this diversity, and interactions with the environment.
3. Demonstrate a fundamental understanding of the relationships between structure and function in animal (human) health.
4. Describe the basic principles of scientific inquiry and the importance of scientific study in integrative biology.
5. Illustrate the process of data collection, statistical analysis, and graphing including basic principles of experimental and sampling design.
6. Critically evaluate data, develop hypotheses, and interpret biological experiments.
7. Communicate effectively in the written presentation of scientific results.

IB offers three types of undergraduate advising: staff advisers, faculty advisers, and peer advisers.

## Staff Advisers

Staff academic advisers are trained to support students and assist them in successfully completing their IB major. They are excellent resources for questions concerning administration and academics or finding out about other available services. Students should see a staff advisor for the following:

- Questions about major requirements

- Advice about schedule planning
- Declare the IB major
- Information about research opportunities, graduate and professional schools, career opportunities, scholarships, and internships
- Scheduling conflicts or registration holds
- Information and registration assistance for independent research credit
- General assistance, advice or information
- Information about upcoming events and programs

Staff advisers are primarily available for drop-in advising, though limited appointments are available for more complex issues such as probation, academic difficulty, and readmission. Students who would like to schedule an appointment should call 510-643-1667 during drop-in advising hours. Current hours can be found on the advising website: <http://ib.berkeley.edu/undergrad>.

The general email address is [ibusso@berkeley.edu](mailto:ibusso@berkeley.edu). This email is checked daily, Monday through Friday, so students will receive a timely answer to their questions.

## Faculty Advisers

Faculty advisers are IB professors assigned to advise students about the IB department, courses, research, and other academic issues. Students meet with a faculty advisor when they declare the IB major. Students should see a faculty advisers for the following:

- Guidance toward achieving academic and career goals
- Questions about the content of IB courses
- Exceptions to IB major requirements and policies after having previously met with a staff adviser
- Questions about biological research and biology in general
- Recommendations on graduate training

For a list of faculty advisers and their office hours, please see speak with a staff advisor in 3060 VLSB. Faculty advisers are not available for office hours during instructional breaks, including summer break. Students may refer to staff drop-in advising hours during summer sessions and non-instructional periods.

## Peer Advisers

Peer advisers are junior and senior IB students who volunteer their time to complement the advising services by sharing their knowledge of and experience with lower division requirements and upper division classes, experience with student groups on campus, preparation for life beyond Cal, and use of various campus resources. To see the schedule and more information about who the peer advisers are and which courses they have taken, click here (<https://ib.berkeley.edu/undergrad/ibpeers>).

## Integrative Biology

### INTEGBI C13 Origins: from the Big Bang to the Emergence of Humans 4 Units

Terms offered: Fall 2018, Fall 2016, Fall 2014

This course will cover our modern scientific understanding of origins, from the Big Bang to the formation of planets like Earth, evolution by natural selection, the genetic basis of evolution, and the emergence of humans. These ideas are of great intrinsic scientific importance and also have far reaching implications for other aspects of people's lives (e.g., philosophical, religious, and political). A major theme will be the scientific method and how we know what we know.

Origins: from the Big Bang to the Emergence of Humans: Read More [+]

#### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 2 hours of discussion per week

#### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Marshall, Quataert

**Also listed as:** ASTRON C13

Origins: from the Big Bang to the Emergence of Humans: Read Less [-]

### INTEGBI 24 Freshman Seminars 1 Unit

Terms offered: Fall 2018, Spring 2018, Fall 2017

The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.

Freshman Seminars: Read More [+]

#### Rules & Requirements

**Repeat rules:** Course may be repeated for credit when topic changes. Course may be repeated for credit when topic changes.

#### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

#### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Final exam required.

Freshman Seminars: Read Less [-]

### INTEGBI 31 The Ecology and Evolution of Animal Behavior 3 Units

Terms offered: Summer 2018 8 Week Session, Spring 2017, Spring 2016

Principles of evolution biology as they relate to animal behavior and behavioral ecology with broad coverage of animal groups. Special attention will be paid to the emerging discipline of behavioral ecology.

The Ecology and Evolution of Animal Behavior: Read More [+]

#### Rules & Requirements

**Prerequisites:** Open to all students; designed for those not specializing in biology

**Credit Restrictions:** Students will receive no credit for Integrative Biology 31 after taking Integrative Biology 144, C144 or Psychology C115B.

#### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture, 1 hour of demonstration, and 1 hour of discussion per week

#### Summer:

6 weeks - 5 hours of lecture, 5 hours of demonstration, and 5 hours of discussion per week

8 weeks - 4 hours of lecture, 2 hours of demonstration, and 2 hours of discussion per week

#### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

The Ecology and Evolution of Animal Behavior: Read Less [-]

## INTEGBI C32 Bioinspired Design 3 Units

Terms offered: Spring 2018, Spring 2017

Bioinspired design views the process of how we learn from Nature as an innovation strategy translating principles of function, performance and aesthetics from biology to human technology. The creative design process is driven by interdisciplinary exchange among engineering, biology, art, architecture and business. Diverse teams of students will collaborate on, create, and present original bioinspired design projects. Lectures discuss biomimicry, challenges of extracting principles from Nature, scaling, robustness, and entrepreneurship through case studies highlighting robots that run, fly, and swim, materials like gecko-inspired adhesives, artificial muscles, medical prosthetic devices, and translation to start-ups.

Bioinspired Design: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Open to all students

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Full

**Formerly known as:** Integrative Biology 32

**Also listed as:** L & S C30Z

Bioinspired Design: Read Less [\[-\]](#)

## INTEGBI N33 Topics in Paleontology: The Age of Dinosaurs 2 Units

Terms offered: Summer 1996 10 Week Session

Open without prerequisite to all students and designed for those not specializing in paleontology. Evolution history, and ecology of the dinosaurs and their world, including the earliest mammals and birds. Topics in Paleontology: The Age of Dinosaurs: Read More [\[+\]](#)

### Rules & Requirements

**Repeat rules:** Course may be repeated for credit with instructor consent. Course may be repeated for credit when topic changes.

### Hours & Format

**Summer:** 8 weeks - 4 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Topics in Paleontology: The Age of Dinosaurs: Read Less [\[-\]](#)

## INTEGBI 35AC Human Biological Variation 4 Units

Terms offered: Fall 2018, Summer 2018 8 Week Session, Fall 2017

This course addresses modern human biological variation from historical, comparative, evolutionary, biomedical, and cultural perspectives. It is designed to introduce students to the fundamentals of comparative biology, evolutionary theory, and genetics.

Human Biological Variation: Read More [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 8 weeks - 6 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Hlusko

Human Biological Variation: Read Less [\[-\]](#)

## INTEGBI 37 Topics in Paleontology: The Antecedents of Man 3 Units

Terms offered: Prior to 2007

. Open without prerequisite to all students and designed for those not specializing in paleontology. Survey the evolution, ecology, and history of the primate order. Special emphasis will be given to primate origins, geographic distribution, and the evolution of the human lineage.

Topics in Paleontology: The Antecedents of Man: Read More [\[+\]](#)

### Hours & Format

**Summer:** 8 weeks - 3 hours of lecture and 2 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Topics in Paleontology: The Antecedents of Man: Read Less [\[-\]](#)



## INTEGBI 39C Topics in Integrative Biology 2 Units

Terms offered: Spring 2013, Spring 2012, Spring 2011

Reading and discussion of the literature on particular topics in the field of integrative biology. Term paper and oral presentation. Section topics will vary from semester to semester. Students should check with department secretary for each semester's offerings.

Topics in Integrative Biology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Preferentially open to freshmen; consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

Topics in Integrative Biology: [Read Less](#) [-]

## INTEGBI 41 Marine Mammals 2 Units

Terms offered: Summer 2018 8 Week Session, Summer 2017 8 Week Session, Fall 2013

A survey of marine mammal evolution, biology, behavior, ecology, and politics with a concentration on those species found in the North Pacific. Coverage would include: origin and evolution of cetaceans, pinnipeds, sirenians, and sea otters; basic biology and anatomy of marine mammal groups, and North Pacific species in particular; ecological interactions and role in nearshore and pelagic marine communities; and interactions between humans and marine mammals.

Marine Mammals: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Designed for those not specializing in Integrative Biology

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

### Summer:

6 weeks - 5 hours of lecture per week

8 weeks - 4 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Marine Mammals: [Read Less](#) [-]

## INTEGBI 42 Primate Biology 3 Units

Terms offered: Summer 1996 10 Week Session

An introduction to the order of mammals of which we are members.

The niches of primates in modern ecosystems, their anatomical and behavioral specialization, and their role as indicator species in conservation. The mechanisms and variety of primate social organization compared with that of other animals.

Primate Biology: [Read More](#) [+]

### Rules & Requirements

**Credit Restrictions:** Open to all students but designed for those not specializing in biology.

### Hours & Format

**Summer:** 8 weeks - 6 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Primate Biology: [Read Less](#) [-]

## INTEGBI 77A Integrative Human Biology 1 Unit

Terms offered: Fall 2018, Fall 2017

Each week a different Integrative Biology faculty member will give a one hour lecture on how their research field contributes to our understanding of human biology. The integration of the disciplines of evolution, ecology, paleontology, comparative physiology, and comparative anatomy in the study of how humans function in ecosystems illuminates our understanding of human biology. During each presentation, the faculty member will also inform students about IB courses they teach, research in their lab, and which Berkeley Natural History Museum they may be affiliated with. This course gives undergraduates an opportunity to learn about the spectrum of research and courses offered by the different IB faculty.

Integrative Human Biology: [Read More](#) [+]

### Rules & Requirements

**Credit Restrictions:** 77A and 77B may each be taken once for credit. Majors are required to take at least one semester of 77A OR 77B.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

**Instructor:** Carlson

Integrative Human Biology: [Read Less](#) [-]

## INTEGBI 77B Integrative Human Biology 1 Unit

Terms offered: Spring 2018

Each week a different Integrative Biology faculty member will give a one hour lecture on how their research field contributes to our understanding of human biology. The integration of the disciplines of evolution, ecology, paleontology, comparative physiology, and comparative anatomy in the study of how humans function in ecosystems illuminates our understanding of human biology. During each presentation, the faculty member will also inform students about IB courses they teach, research in their lab, and which Berkeley Natural History Museum they may be affiliated with. This course gives undergraduates an opportunity to learn about the spectrum of research and courses offered by the different IB faculty.

Integrative Human Biology: Read More [+]

### Rules & Requirements

**Credit Restrictions:** 77A and 77B may each be taken once for credit. Majors are required to take at least one.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of seminar per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

**Instructor:** Carlson

Integrative Human Biology: Read Less [-]

## INTEGBI C82 Oceans 3 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

This course offers multidisciplinary approach to begin answering the question "Why are oceans important to us?" Upon a physical, chemical, and geologic base, we introduce the alien world of sea life, the importance of the ocean to the global carbon cycle, and the principles of ecology with a focus on the important concept of energy flow through food webs. Lectures expand beyond science to include current topics as diverse as music, movies, mythology, biomechanics, policy, and trade.

Oceans: Read More [+]

### Rules & Requirements

**Credit Restrictions:** Students will receive no credit for Earth and Planetary Science C82/Integrative Biology C82 after completing Integrative Biology 82 or Earth and Planetary Science N82.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Summer:

6 weeks - 7.5 hours of lecture and 2.5 hours of discussion per week

8 weeks - 5.5 hours of lecture and 1.5 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Also listed as:** EPS C82

Oceans: Read Less [-]

## INTEGBI 84 Sophomore Seminar 1 or 2 Units

Terms offered: Fall 2018, Spring 2018, Fall 2017

Sophomore seminars are small interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores.

Sophomore Seminar: Read More [+]

### Rules & Requirements

**Prerequisites:** At discretion of instructor

**Repeat rules:** Course may be repeated for credit when topic changes. Course may be repeated for credit when topic changes.

### Hours & Format

#### Fall and/or spring:

5 weeks - 3-6 hours of seminar per week

10 weeks - 1.5-3 hours of seminar per week

15 weeks - 1-2 hours of seminar per week

#### Summer:

6 weeks - 2.5-5 hours of seminar per week

8 weeks - 1.5-3.5 hours of seminar and 2-4 hours of seminar per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** The grading option will be decided by the instructor when the class is offered. Final exam required.

Sophomore Seminar: Read Less [-]

## INTEGBI 87 Introduction to Research Methods in Biology 2 Units

Terms offered: Summer 2014 8 Week Session, Summer 2013 8 Week Session, Summer 2012 8 Week Session

This course provides a functional understanding of hypothesis/data driven research and exposure to current approaches and methods in biological science. The lectures address foundational concepts of the scientific method, research ethics, scientific communication, and how to understand scientific literature. The labs provide exposure to faculty research and experimental methods. The course is geared to incoming freshmen, sophomores, and transfer students interested in learning more about research.

Introduction to Research Methods in Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Summer:** 8 weeks - 1 hour of lecture, 1 hour of discussion, and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

**Instructor:** Matsui

Introduction to Research Methods in Biology: Read Less [-]

## INTEGBI 88 Leadership Communications for Biology Scholars 1 Unit

Terms offered: Fall 2009, Fall 2008, Fall 2007

Leadership skills and abilities such as communication, collaboration, critical thinking, and resourcefulness are critical to academic, professional, and personal success. The need for enlightened leaders is evident in every aspect of health and science such as designing innovative health programs, obtaining funding, conducting cutting-edge research, developing and gaining support to implement policy solutions. This course provides an understanding of the principles of leadership and communications for students in the Biology Scholars Program. Students will nurture those traits in themselves and apply those principles in situations specifically related to the health and science sectors. Leadership Communications for Biology Scholars: Read More [+]

### Rules & Requirements

**Prerequisites:** Acceptance into Biology Scholars Program

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Hayes, Kim, Myrick

Leadership Communications for Biology Scholars: Read Less [-]

## INTEGBI 95 Special Research Project in Biology 1B 2 Units

Terms offered: Spring 2017, Fall 2016, Spring 2016

Students enrolled in Biology 1B can participate in special field research in addition to attending regular laboratory sections. Students work independently with minimal supervision. Students will learn how to develop a project, collect and record data, conduct and analyze experiments, write a report, and make an oral presentation. Project may require traveling to off-campus sites, and may include night or weekend work.

Special Research Project in Biology 1B: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor; selected by interview

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of fieldwork and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Special Research Project in Biology 1B: [Read Less](#) [-]

## INTEGBI 95B Lawrence Hall of Science Teaching Assistant 1 - 2 Units

Terms offered: Prior to 2007

Enrollment into this course is for students interested in teaching science to children under the guidance of the Lawrence Hall of Science Instructors and Staff. As a LHS Teaching Assistant (TA), you will have the opportunity to assist with workshops serving grade school-aged children and to lead small discussion groups. The workshops consist of organismal biology related materials. You will undergo training in the Hall's Animal Discovery Room to ensure that you are prepared to support school and public programs scheduled in that space. There will also be opportunities to travel to nearby school districts to give presentations on the materials you work with.

Lawrence Hall of Science Teaching Assistant: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Students must be concurrently enrolled or have completed Biology 1B

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3-6 hours of fieldwork per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Lawrence Hall of Science Teaching Assistant: [Read Less](#) [-]

## INTEGBI C96 Studying the Biological Sciences 1 Unit

Terms offered: Fall 2018, Fall 2017, Fall 2016

Freshmen will be introduced to the "culture" of the biological sciences, along with an in-depth orientation to the academic life and the culture of the university as they relate to majoring in biology. Students will learn concepts, skills, and information that they can use in their major course, and as future science professionals. Restricted to freshmen in the biology scholars program.

Studying the Biological Sciences: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

**Instructor:** Matsui

**Also listed as:** MCELLBI C96/PLANTBI C96

Studying the Biological Sciences: [Read Less](#) [-]

## INTEGBI 98 Directed Group Study 1 - 4 Units

Terms offered: Spring 2016, Fall 2015, Spring 2015

Lectures and small group discussions focusing on topics of interest, varying from semester to semester.

Directed Group Study: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Freshmen and sophomores only

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of directed group study per week

### Summer:

6 weeks - 2.5-10 hours of directed group study per week

8 weeks - 1.5-7.5 hours of directed group study per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Directed Group Study: [Read Less](#) [-]

## INTEGBI 99 Supervised Independent Study and Research 1 - 3 Units

Terms offered: Spring 2015, Spring 2014, Fall 2013

Lower division independent study and research intended for the academically superior student. Enrollment only with prior approval of faculty adviser directing the research.

Supervised Independent Study and Research: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** GPA of 3.4 or greater

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Summer:

6 weeks - 1-3 hours of independent study per week

8 weeks - 1-3 hours of independent study per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

**Formerly known as:** Botany 99, Physiology 99, Anatomy 99

Supervised Independent Study and Research: Read Less [\[-\]](#)

## INTEGBI 100B Principles of Biodiversity 3 Units

Terms offered: Fall 2012, Spring 2002, Spring 2001

Biogeographic, temporal, and historical patterns of change in biological diversity; phylogenetics and systematics; processes involved in origin and extinction of taxa and floras/faunas; population structure and demography (including human populations); community processes and maintenance of diversity; ecosystem function; global change; human uses of and effects on biodiversity; conservation biology.

Principles of Biodiversity: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Principles of Biodiversity: Read Less [\[-\]](#)

## INTEGBI C100 Communicating Ocean Science 4 Units

Terms offered: Spring 2018, Spring 2016, Spring 2015

For undergraduates interested in improving their ability to communicate their scientific knowledge by teaching ocean science in elementary schools or science centers/aquariums. The course will combine instruction in inquiry-based teaching methods and learning pedagogy with six weeks of supervised teaching experience in a local school classroom or the Lawrence Hall of Science with a partner. Thus, students will practice communicating scientific knowledge and receive mentoring on how to improve their presentations.

Communicating Ocean Science: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** One course in introductory biology, geology, chemistry, physics, or marine science required and interest in ocean science; junior, senior, or graduate standing; consent of instructor required for sophomores

### Hours & Format

**Fall and/or spring:** 15 weeks - 2.5 hours of lecture, 1 hour of discussion, and 2 hours of fieldwork per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Ingram

**Also listed as:** EPS C100/GEOG C146

Communicating Ocean Science: Read Less [\[-\]](#)

## INTEGBI 101 Introduction to Scientific Writing 4 Units

Terms offered: Spring 2018, Fall 1997

This course will introduce students to concepts and techniques for effective communication of scientific findings, both within the scientific community and to the general public. Students will be exposed to a variety of formats, including systematic observations in field journals, proposals, conference presentations, seminars, journal articles, popular science writing, and interviews. Students can expect to gain a sense of confidence in writing and public speaking about research. Direct language is valued in scientific writing, but creative approaches to style and structure will be emphasized.

Introduction to Scientific Writing: Read More [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of seminar per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Fine

Introduction to Scientific Writing: Read Less [\[-\]](#)



## INTEGBI 102LF Introduction to California Plant Life with Laboratory 4 Units

Terms offered: Spring 2018, Spring 2015, Spring 2013

The relationship of the main plant groups and the plant communities of California to climate, soils, vegetation, geological and recent history, and conservation. Laboratory will also include at least two Saturday field trips and focus on main plant groups and major plant families in California, and use of keys to identify introduced and especially native pteridophytes, conifers, and flowering plants of the state.

Introduction to California Plant Life with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B or consent of instructor

**Credit Restrictions:** Student will receive partial credit for 102LF after taking 102.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

**Summer:** 8 weeks - 4 hours of lecture and 12 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Formerly known as:** 102L

Introduction to California Plant Life with Laboratory: Read Less [\[-\]](#)

## INTEGBI 103LF Invertebrate Zoology with Laboratory 5 Units

Terms offered: Spring 2018, Spring 2016, Spring 2014

Introductory survey of the biology of invertebrates, stressing comparative functional morphology, phylogeny, natural history, and aspects of physiology and development. Laboratory study of invertebrate diversity and functional morphology, and field study of the natural history of local marine invertebrates.

Invertebrate Zoology with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A-1B

**Credit Restrictions:** Students will receive partial credit for 103LF after taking 103.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Invertebrate Zoology with Laboratory: Read Less [\[-\]](#)

## INTEGBI 104LF Natural History of the Vertebrates with Laboratory 5 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

Biology of the vertebrates, exclusive of fish. Laboratory and field study of local vertebrates exclusive of fish.

Natural History of the Vertebrates with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A-1B

**Credit Restrictions:** Students will receive partial credit for 104LF after taking 104.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture, 4 hours of fieldwork, and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** McGuire, Bowie, Shabel

Natural History of the Vertebrates with Laboratory: Read Less [\[-\]](#)

## INTEGBI C105 Natural History Museums and Biodiversity Science 3 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

(1) survey of museum resources, including strategies for accession, conservation, collecting and acquiring material, administration, and policies; (2) strategies for making collections digitally available (digitization, databasing, georeferencing, mapping); (3) tools and approaches for examining historical specimens (genomics, isotopes, ecology, morphology, etc); and (4) data integration and inference. The final third of the course will involve individual projects within a given museum.

Natural History Museums and Biodiversity Science: Read More [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructors:** Gillespie, Mishler, Will, Marshall, McGuire

**Also listed as:** ESPM C105

Natural History Museums and Biodiversity Science: Read Less [\[-\]](#)

## INTEGBI 106A Physical and Chemical Environment of the Ocean 4 Units

Terms offered: Spring 2012, Spring 2010, Spring 2008

The biological implications of marine physics and chemistry. History and properties of seawater. Geophysical fluids. Currents and circulations. Deep sea. Waves, tides, and bottom boundary layers. The coastal ocean; estuaries. Air/sea interaction. Mixing. Formation of water masses. Modeling biological and geochemical processes. Ocean and climate change.

Physical and Chemical Environment of the Ocean: Read More [a]

### Rules & Requirements

**Prerequisites:** Biology 1B; Chemistry 1A or 4A; Mathematics 1A or 16A; Physics 7A or 8A. Recommended: Integrative Biology 82

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Physical and Chemical Environment of the Ocean: Read Less [-]

## INTEGBI C107L Principles of Plant Morphology with Laboratory 4 Units

Terms offered: Fall 2017, Fall 2016, Fall 2015

An analysis of the structural diversity of land plants with emphasis on the developmental mechanisms responsible for this variation in morphology and the significance of this diversity in relation to adaptation and evolution.

Principles of Plant Morphology with Laboratory: Read More [a]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture, 1 hour of discussion, and 4 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Specht

**Also listed as:** PLANTBI C107L

Principles of Plant Morphology with Laboratory: Read Less [-]

## INTEGBI C109 Evolution and Ecology of Development 3 Units

Terms offered: Fall 2018, Fall 2016

From the seahorse's body to the venus flytrap's jaws to the human brain, nature abounds with amazing adaptations. This interdisciplinary course explores how and why such biodiversity evolves as well as what limits diversity. Lectures and case studies will focus on core concepts, recent advances, and integrative approaches, placing special emphasis on the interplay between gene regulatory networks, the environment, and population genetics.

Evolution and Ecology of Development: Read More [a]

### Objectives Outcomes

- Student Learning Outcomes:**
- Explain how an interdisciplinary approach involving genetics, development, evolutionary biology, and ecology can be used to understand the processes that generate patterns of biodiversity.
  - List and describe major questions, findings, and experimental approaches in the field of ecological and evolutionary developmental biology.
  - Discuss biological research using specialized terminology and defend your opinions.
  - Critically evaluate and interpret the primary scientific literature.
  - Combine factual material with deductive reasoning to propose hypotheses and future research directions

### Rules & Requirements

**Prerequisites:** BIOLOGY 1A and 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Blackman

**Also listed as:** PLANTBI C109

Evolution and Ecology of Development: Read Less [-]

## **INTEGBI C110L Biology of Fungi with Laboratory 4 Units**

Terms offered: Fall 2016, Fall 2014

Selected aspects of fungi: their structure, reproduction, physiology, ecology, genetics and evolution; their role in plant disease, human welfare, and industry. Offered even fall semesters.

Biology of Fungi with Laboratory: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Biology 1B

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

### **Additional Details**

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Bruns, Taylor

**Also listed as:** PLANTBI C110L

Biology of Fungi with Laboratory: [Read Less](#) [-]

## **INTEGBI 112 Horticultural Methods in the Botanical Garden 1 Unit**

Terms offered: Fall 2018, Fall 2017, Fall 2016

An introduction to horticultural techniques utilizing the diverse collections of the University Botanical Garden.

Horticultural Methods in the Botanical Garden: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Consent of instructor

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 3 hours of fieldwork per week

### **Additional Details**

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

**Instructor:** Licht

**Formerly known as:** 112L

Horticultural Methods in the Botanical Garden: [Read Less](#) [-]

## **INTEGBI 113L Paleobiological Perspectives on Ecology and Evolution 4 Units**

Terms offered: Spring 2018, Spring 2017, Spring 2016

This course will center around answering the following questions: What do the fossil and geologic records have to tell us about the nature of ecological and evolutionary processes? What do they teach us that cannot be learned from the living world alone? In answering these questions, the course will provide an introduction to the analysis of key problems in paleobiology, with an emphasis on how evolutionary and ecological processes operate on geologic timescales.

Paleobiological Perspectives on Ecology and Evolution: [Read More](#) [+]

### **Rules & Requirements**

**Prerequisites:** Prior biology experience, or consent of instructor. No paleontological or geological background required

### **Hours & Format**

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

### **Additional Details**

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Marshall

**Formerly known as:** 108

Paleobiological Perspectives on Ecology and Evolution: [Read Less](#) [-]

## INTEGBI 114 Infectious Disease Dynamics 4 Units

Terms offered: Spring 2017

Many of the challenges of managing infectious disease are essentially ecological and evolutionary problems. Disease follows the rules of species interactions as it spreads through host populations while resistance to antibiotics occurs through the rules of evolutionary biology. The key aim of the module is to teach ecological and evolutionary principles in the light of infectious diseases affecting human populations and societies as well as agriculture and wildlife. This is applied ecology and applied evolution writ large.

Infectious Disease Dynamics: [Read More](#) [+]

### Objectives Outcomes

**Student Learning Outcomes:** - Understanding the role of infectious disease in natural populations and communities

- Understand the role of disease in shaping human agriculture and societies
- Describe how infectious disease may be important in conservation
- Discuss when parasite virulence makes sense in the light of evolution
- Explain how to apply ecological and evolutionary principles to the treatment and control of infectious
- Present a scientific poster on the evidence for coevolution between a pair of species.

### Rules & Requirements

**Prerequisites:** Bio 1A and Bio 1B or equivalent required, Ecology or Evolution course suggested

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Boots

Infectious Disease Dynamics: [Read Less](#) [-]

## INTEGBI 115 Introduction to Systems in Biology and Medicine 4 Units

Terms offered: Spring 2015, Spring 2014, Fall 2013

This course is aimed at students wishing to understand the general principles of how biological systems operate. Topics include feedback regulation; competition and cooperation; genetic switches and circuits; random processes; chaos; mechanisms for error correction; and the properties of networks. Examples are selected from many fields including medicine, physiology, ecology, biochemistry, cell biology, and genetics. Students will learn to conceptualize and quantify interactions within biological systems using simple mathematical models and computer programs. No previous experience in programming is required.

Introduction to Systems in Biology and Medicine: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A, Mathematics 1A or 16B

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 2 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Lim

Introduction to Systems in Biology and Medicine: [Read Less](#) [-]

## INTEGBI 116L Medical Parasitology 4 Units

Terms offered: Summer 2018 First 6 Week Session, Summer 2017 First 6 Week Session, Summer 2016 First 6 Week Session

This course includes the biology, epidemiology, pathogenesis, treatment, and prevention of various medically important parasitic infections. Life cycles of parasitic helminths and protozoa, the biological aspects of the host-parasite relationship, the epidemiology of the infection, and the interplay of social, economical, and ecological factors which contribute to the disease will be covered in both lectures and videos.

Medical Parasitology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** 1A, 1B, or equivalent

### Hours & Format

**Summer:** 6 weeks - 6 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Sakanari

**Formerly known as:** 116

Medical Parasitology: [Read Less](#) [-]

**INTEGBI 117 Medical Ethnobotany 2 Units**

Terms offered: Fall 2018, Fall 2017, Fall 2016

Biological diversity and ethno-linguistic diversity sustain traditional botanical medicine systems of the world. Major topics covered in this course include cultural origins of medicinal plant knowledge on plant-derived pharmaceuticals and phytomedicines; field research methods in ethnobotany and ethnopharmacology; examples of how traditional botanical medicines provide safe, effective, affordable, and sustainable primary health care to tropical countries; human physiology, human diseases, and mechanisms of action of plant-derived drugs.

Medical Ethnobotany: Read More [+]

**Rules & Requirements**

**Prerequisites:** Bio 1A

**Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

**Summer:** 6 weeks - 5 hours of lecture per week

**Additional Details**

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Carlson

Medical Ethnobotany: Read Less [-]

**INTEGBI 117LF Medical Ethnobotany Laboratory 2 Units**

Terms offered: Fall 2018, Fall 2017, Fall 2016

Laboratory will focus on studying medicinal plants from the major ecosystems and geographical regions of the world. Students will learn common names, scientific names, plant families, field identification, habitats, and ethnomedical uses of medicinal plants. How the medicinal plant is prepared, administered, and used as a phytomedicine will also be discussed. There will be reference to the phylogenetic relationships between the plant families and genera represented by the medicinal plants.

Medical Ethnobotany Laboratory: Read More [+]

**Rules & Requirements**

**Prerequisites:** Bio 1B

**Hours & Format**

**Fall and/or spring:** 15 weeks - 6 hours of laboratory per week

**Summer:** 6 weeks - 8 hours of laboratory per week

**Additional Details**

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Carlson

Medical Ethnobotany Laboratory: Read Less [-]

**INTEGBI 118 Host-Microbe Interactions 4 Units**

Terms offered: Fall 2018, Fall 2017, Fall 2016

We live in a microbial world, and microbes have shaped (and continue to shape) plant and animal physiology and evolution through a myriad of contributions – from mutualistic benefits to disease. Recent advances in genomic methodologies have further increased our appreciation of such contributions by highlighting the prevalence of organismal microbial communities and their complex interactions with their hosts. Through lectures and discussions, IB 118 will consider the broad range of host-microbe interactions – from mutualism to pathogenesis, and from pairwise interactions to the microbiome - learning the principles that shape these interactions, the technologies used to interrogate them and the molecular mechanisms underlying them.

Host-Microbe Interactions: Read More [+]

**Rules & Requirements**

**Prerequisites:** Biology 1A-1B

**Hours & Format**

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Additional Details**

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Shapira

Host-Microbe Interactions: Read Less [-]

**INTEGBI 119 Evaluating Scientific Evidence in Medicine 3 Units**

Terms offered: Spring 2015, Fall 2014, Spring 2013

A course in critical analysis of medical reports and studies using recent controversial topics in medicine. Course will focus on information gathering, hypothesis testing, evaluating study design, methodological problems, mechanisms of bias, interpretation of results, statistics, and attribution of causation. Students participate in a mock trial as a way to demonstrate their abilities to gather, critically analyze, and present scientific and medical evidence.

Evaluating Scientific Evidence in Medicine: Read More [+]

**Rules & Requirements**

**Prerequisites:** Biology 1A-1B

**Hours & Format**

**Fall and/or spring:** 15 weeks - 2 hours of lecture, 1 hour of discussion, and 1 hour of laboratory per week

**Additional Details**

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** G. Caldwell

Evaluating Scientific Evidence in Medicine: Read Less [-]



## INTEGBI 123AL Exercise and Environmental Physiology with Laboratory 5 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

Discussion of how chemical energy is captured within cells and how potential chemical energy is converted to muscular work. Energetics, direct and indirect calorimetry, pathways of carbon flow in exercise, ventilation, circulation, skeletal muscle fiber types. Laboratory component of the course is to obtain practical experience in the measurement of physiological parameters and to be able to compile, compare, contrast, and interpret physiological data. Laboratory demonstrations and exercises will explain lecture content.

Exercise and Environmental Physiology with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A, Chemistry 3B and Integrative Biology 132 or Molecular and Cell Biology 136

**Credit Restrictions:** Student will receive partial credit for 123AL after taking 123A.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Brooks

Exercise and Environmental Physiology with Laboratory: Read Less [\[-\]](#)

## INTEGBI C125L Introduction to the Biomechanical Analysis of Human Movement 4 Units

Terms offered: Fall 2016, Fall 2015, Fall 2014, Fall 2013

Basic biomechanical and anatomical concepts of human movement and their application to fundamental movement patterns, exercise, and sport skills.

Introduction to the Biomechanical Analysis of Human Movement: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Physical Education 9 and Integrative Biology 131 and 131L

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Scott

**Also listed as:** PHYS ED C165

Introduction to the Biomechanical Analysis of Human Movement: Read Less [\[-\]](#)

## INTEGBI 127L Motor Control with Laboratory 3 Units

Terms offered: Fall 2014, Fall 2013, Fall 2012

Neural control of movement in humans and other animals. Lectures introduce basic theories of information and control, analyze motor control at the spinal level, survey anatomy and physiology of motor systems of the brain, and synthesize theory and physiology to understand control systems that regulate posture, locomotion, and voluntary movements. In laboratories, students learn theory and motor physiology hands-on, and design and perform independent investigations.

Motor Control with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 132 or Molecular and Cell Biology 136

**Credit Restrictions:** Students will receive partial credit for 127L after taking 127.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 2 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Lehman

Motor Control with Laboratory: Read Less [\[-\]](#)

## INTEGBI 128 Sports Medicine 3 Units

Terms offered: Summer 2018 First 6 Week Session, Summer 2017 First 6 Week Session, Summer 2016 First 6 Week Session

Survey course of sports medicine including topics of athletic injury (cause, evaluation, and treatment options), exercise physiology, exercise and health, fitness testing, issues specific to female athletes, drug abuse in sports, environmental issues (heat, altitude, sun exposure), nutrition, careers in sports medicine, introduction to clinical research.

Sports Medicine: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Background in anatomy, physiology, or exercise physiology recommended

### Hours & Format

#### Summer:

6 weeks - 5 hours of lecture and 2 hours of discussion per week

8 weeks - 5 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** McLaughlin

Sports Medicine: Read Less [\[-\]](#)

## INTEGBI C129L Human Physiological Assessment 3 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

Principles and theories of human physiological assessment in relation to physical activity and conditioning. Performance of laboratory procedures in the measurement and interpretation of physiological fitness (cardiorespiratory endurance, body composition, musculoskeletal fitness). Human Physiological Assessment: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A, IB 132 (may be taken concurrently); IB 123AL is recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 3 hours of laboratory per week

**Summer:** 6 weeks - 5 hours of lecture and 7.5 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Johannessen

**Also listed as:** PHYS ED C129

Human Physiological Assessment: Read Less [\[-\]](#)

## INTEGBI 130L Comparative Vertebrate Anatomy & Functional Morphology 5 Units

Terms offered: Spring 2000, Spring 1998, Fall 1995

This course is an in-depth look at the biology of form and function. We will examine anatomy and compare features among fish, amphibians, reptiles, birds, and mammals (including humans) to understand how structures develop, how they have evolved, and how they interact with one another to allow animals to live in a variety of environments. We will study the integration of the skeletal, muscular, nervous, vascular, respiratory, digestive, endocrine, and urogenital systems to explore the historical and present diversity of vertebrate animals.

Comparative Vertebrate Anatomy & Functional Morphology: Read More [\[+\]](#)

### Objectives Outcomes

**Student Learning Outcomes:** 1. A comparative approach will allow students to gain experience in observing similarities and differences among taxa and identifying trends in vertebrate form and function. This will allow them to further their understanding of how both evolutionary and environmental contexts influence morphology and function. 2. Students will improve their understanding of the scientific method, particularly through the independent research experience provided during the term paper and project. 3. Students will gain factual knowledge of terms and concepts regarding vertebrate anatomy and functional morphology.

### Rules & Requirements

**Prerequisites:** Biology 1B

### Hours & Format

**Summer:** 8 weeks - 6 hours of lecture, 2 hours of discussion, and 12 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Comparative Vertebrate Anatomy & Functional Morphology: Read Less [\[-\]](#)

## INTEGBI 131 General Human Anatomy 3 Units

Terms offered: Fall 2018, Summer 2018 First 6 Week Session, Fall 2017  
The functional anatomy of the human body as revealed by gross and microscopic examination. Designed to be taken concurrently with 131L.

General Human Anatomy: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A-1B or Chemistry 1A

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Summer:

6 weeks - 8 hours of lecture per week

8 weeks - 6 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Carlson

General Human Anatomy: Read Less [\[-\]](#)

## INTEGBI 131A Applied Anatomy 1 Unit

Terms offered: Fall 2014, Fall 2013, Fall 2012

A series of 15 lectures by former students of 131 who have become successful physicians and surgeons. The purpose is to provide the practical applications of anatomy, e.g., plastic surgeons, neurosurgeons, vascular surgeons, pathologists, etc.

Applied Anatomy: Read More [\[+\]](#)

### Rules & Requirements

**Repeat rules:** Course may be repeated for credit up to a total of 2 units. Course may be repeated for a maximum of 2 units.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

Applied Anatomy: Read Less [\[-\]](#)

## INTEGBI 131L General Human Anatomy Laboratory 2 Units

Terms offered: Fall 2018, Summer 2018 First 6 Week Session, Spring 2018

Prepared human dissections, models, and microscopic slides.

General Human Anatomy Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A-1B or Chemistry 1A. 131 (may be taken concurrently)

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of laboratory per week

### Summer:

6 weeks - 10 hours of laboratory per week

8 weeks - 8 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Carlson

General Human Anatomy Laboratory: Read Less [\[-\]](#)

## INTEGBI 132 Survey of Human Physiology 4 Units

Terms offered: Spring 2018, Summer 2017 8 Week Session, Spring 2017  
Mechanisms by which key physiological priorities are maintained in healthy humans. From a basis in elementary theories of information and control, we develop an understanding of homeostasis of cellular composition, structure, and energy metabolism. We then study neural and endocrine signaling in humans, and develop the key concepts of control and homeostasis in all the major organ and multi-organ systems, including cardiovascular, respiratory, renal, metabolic, reproductive, and immune systems, growth and development, and sensory and motor systems.

Survey of Human Physiology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Integrative Biology 131, Biology 1A

**Credit Restrictions:** Students will receive no credit for Integrative Biology 132 after completing Molecular and Cell Biology 136.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 8 weeks - 6 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Brooks, Kaufer, Lehman

Survey of Human Physiology: Read Less [\[-\]](#)

## INTEGBI 132L Mammalian Physiology Laboratory 2 Units

Terms offered: Spring 2018, Spring 2017, Summer 2016 8 Week Session  
In the laboratory component of Integrative Biology 132, students gain hands-on experience measuring physiological parameters, interpreting physiological data, designing experiments, and communicating ideas in writing and orally. Guided investigations include measurements of membrane potentials, responses of skeletal muscle to electrical stimulation, electromyography, pulmonary and cardiovascular measurements in humans, contractility and regulation of the frog heart, human electrocardiography, and renal control of body fluids. In two independent investigations, students identify their own questions, develop hypotheses, design and perform experiments, and present their studies in symposia. Background in elementary statistics, data analysis and oral presentation are also provided.

Mammalian Physiology Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Previous or concurrent enrollment in 132 or equivalent, or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of laboratory per week

**Summer:** 8 weeks - 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Brooks, Kaufer, Lehman

Mammalian Physiology Laboratory: Read Less [\[-\]](#)

## INTEGBI 133 Anatomy Enrichment Program 2 Units

Terms offered: Spring 2011, Spring 2010, Spring 2009

The purpose of the course is for University students to teach human anatomy to grades K-7 in the public schools. The UCB students work in groups of 2-3 to plan their presentations of the systems of the body and then enter the school rooms to teach what they have learned in 131.

Anatomy Enrichment Program: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 131 with a grade of A or B

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of fieldwork per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam required.

Anatomy Enrichment Program: Read Less [\[-\]](#)

## INTEGBI 135 The Mechanics of Organisms 4 Units

Terms offered: Spring 2016, Fall 2013, Fall 2011

Organism design in terms of mechanical principles; basics of fluid and solid mechanics with examples of their biological implications, stressing the dependence of mechanical behavior and locomotion on the structure of molecules, tissues, structural elements, whole organisms, and habitats. The Mechanics of Organisms: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Introductory physics and biology recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Dudley, Full, Koehl

The Mechanics of Organisms: [Read Less](#) [-]

## INTEGBI C135L Laboratory in the Mechanics of Organisms 3 Units

Terms offered: Spring 2015, Spring 2014, Spring 2013, Spring 2012

Introduction to laboratory and field study of the biomechanics of animals and plants using fundamental biomechanical techniques and equipment. Course has a series of rotations involving students in experiments demonstrating how solid and fluid mechanics can be used to discover the way in which diverse organisms move and interact with their physical environment. The laboratories emphasize sampling methodology, experimental design, and statistical interpretation of results. Latter third of course devoted to independent research projects. Written reports and class presentation of project results are required. Laboratory in the Mechanics of Organisms: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Integrative Biology 135 or consent of instructor; for Electrical Engineering and Computer Science students, Electrical Engineering 105, 120 or Computer Science 184

**Credit Restrictions:** Students will receive no credit for C135L after taking 135L.

### Hours & Format

**Fall and/or spring:** 15 weeks - 6 hours of laboratory, 1 hour of discussion, and 1 hour of fieldwork per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Formerly known as:** Integrative Biology 135L

**Also listed as:** BIO ENG C136L/EL ENG C145O

Laboratory in the Mechanics of Organisms: [Read Less](#) [-]

## INTEGBI 136 The Biology of Sex 4 Units

Terms offered: Fall 2014, Summer 1991 10 Week Session

The ability to reproduce is a defining characteristic of life, and of great interest to biologists as well as humanity in general. What is sex, and why did it develop? Why do we have sexual reproduction, whereas some animals do not? This course will provide a comprehensive overview on the biology of sex from an evolutionary perspective with an emphasis on humans in comparison to other species. The course will consist of two lectures each week, and a lab where we discuss a paper, watch videos, or have discussion sections on specific topics that were covered in class. The Biology of Sex: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1B, introductory genetics (Mendelian genetics, recombination, chromosomes)

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Bachtrog

The Biology of Sex: [Read Less](#) [-]

## INTEGBI 137 Human Endocrinology 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

Course will address the role of hormones in physiology with a focus on humans. Regulation of hormone secretion and mechanisms of hormone action will be discussed. Physiological processes to be addressed include reproduction, metabolism, water balance, growth, fetal development. Experimental and clinical aspects will be addressed. Human Endocrinology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B; human physiology (132) strongly recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Hayes

Human Endocrinology: [Read Less](#) [-]



## INTEGBI 138 Comparative Endocrinology 4 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

The primary goal of this course is to provide students with a broad understanding of the evolution of hormonal systems. A comparative approach allows us to envisage how the complex mammalian endocrine system presumably evolved from that of more primitive vertebrates. Students will learn about endocrine pathways and endocrine-based behaviors of jawless fishes, fishes, amphibia, reptiles, birds, and mammals. In addition, students will gain an understanding of the experimental methods used in endocrine research. The class teaches students how to read and interpret the primary scientific literature; thus it encourages the critical thinking that is a fundamental skill for any scientist.

Comparative Endocrinology: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B. Organic Chemistry recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Bentley

Comparative Endocrinology: [Read Less](#) [-]

## INTEGBI 139 The Neurobiology of Stress 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

This course is designed to be an interdisciplinary course. It will adopt a broad-based approach to explore the concepts of stress, health, and disease, with a particular focus on current primary literature. The course will cover multiple dimensions in the study of stress, which employ genetic, epigenetic, molecular, cellular, physiological, and cognitive approaches, especially in the context of endocrine and neuroscience research. We will analyze the individual response to stress, how genetic and environmental factors play a role in it, how it translates to physiological and mental health and well-being vs. pathological conditions, and put that in a public health perspective.

The Neurobiology of Stress: [Read More](#) [+]

### Objectives Outcomes

**Course Objectives:** This course will emphasize the interconnected and multidirectional relationships between biology, behavior and the social environment. The study of stress is necessarily an interdisciplinary endeavor. This course is designed to explore the role of genes, hormones and experiences as they affect the stress-response and subsequently brain and behavior.

### Rules & Requirements

**Prerequisites:** Biology 1A or Psychology 110. You will need a good understanding of the fundamentals of biology to do well in this class

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Kaufer

The Neurobiology of Stress: [Read Less](#) [-]

## INTEGBI 140 Biology of Human Reproduction 4 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

Course focuses on biological and cultural aspects of human reproduction including conception, embryology, pregnancy, labor, delivery, lactation, infant/child development, puberty, and reproductive aging. This includes study of factors that diminish and factors that enhance fertility, reproduction, and maternal-child health. We explore evolutionary, ecological, environmental, cultural, ethnobiological, and nutritional determinants of fertility, reproductive rate, infant survival, and population growth.

Biology of Human Reproduction: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A or equivalent

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 6 weeks - 8 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Carlson

Biology of Human Reproduction: Read Less [-]

## INTEGBI 141 Human Genetics 3 Units

Terms offered: Summer 2018 8 Week Session, Summer 2017 8 Week Session, Summer 2016 8 Week Session

Principles of inheritance, especially as applied to human traits, including molecular aspects of genetics, the genetic constitutions of populations, and questions of heredity/environment.

Human Genetics: Read More [+]

### Rules & Requirements

**Prerequisites:** One course in biological science

**Credit Restrictions:** Students will receive no credit for 141 after taking Molecular and Cell Biology 142 or C142 and Integrative Biology C163.

### Hours & Format

**Summer:** 8 weeks - 6 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Human Genetics: Read Less [-]

## INTEGBI C142L Introduction to Human Osteology 6 Units

Terms offered: Spring 2018, Spring 2016, Spring 2014

An intensive study of the human skeleton, reconstruction of individual and population characteristics, emphasizing methodology and analysis of human populations from archaeological and paleontological contexts, taphonomy, and paleopathology.

Introduction to Human Osteology: Read More [+]

### Rules & Requirements

**Prerequisites:** Anthropology 1, Biology 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 6 hours of lecture and 14 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** White

**Also listed as:** ANTHRO C103

Introduction to Human Osteology: Read Less [-]

## INTEGBI C143A Biological Clocks: Physiology and Behavior 3 Units

Terms offered: Fall 2018, Fall 2016, Fall 2012

A consideration of the biological clocks that generate daily, lunar, seasonal and annual rhythms in various animals including people. Emphasis on neuroendocrine substrates, development and adaptive significance of estrous cycles, feeding rhythms, sleep-wakefulness cycles, reproductive and hibernation cycles, body weight and migratory cycles.

Biological Clocks: Physiology and Behavior: Read More [+]

### Rules & Requirements

**Prerequisites:** Completion of biological prerequisites for the major and one of the following: 110 or a course in animal organismal physiology (Integrative Biology 132, 138, 140, 148, or Molecular and Cell Biology 160)

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Kriegsfeld

**Also listed as:** PSYCH C113

Biological Clocks: Physiology and Behavior: Read Less [-]

## INTEGBI C143B Hormones and Behavior 3 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

This course provides a comprehensive overview of behavioral endocrinology beginning with hormone production and actions on target issues and continuing with an exploration of a variety of behaviors and their hormonal regulation/consequences. The course uses a comparative approach to examine the reciprocal interactions between the neuroendocrine system and behavior, considering the effects of hormone on development and adult behavior in addition to how behavior regulates endocrine physiology. While much of the course focuses on non-human vertebrate species, the relevance to humans is explored where appropriate. Topics include sexual differentiation and sex differences in behavior, reproductive, parental, and aggressive behaviors, and hormonal and behavioral homeostatic regulation.

Hormones and Behavior: Read More [+]

### Rules & Requirements

**Prerequisites:** Completion of biological prerequisites for the major and consent of instructor; a course in mammalian physiology recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Kriegsfeld

**Also listed as:** PSYCH C116

Hormones and Behavior: Read Less [-]

## INTEGBI C144 Animal Behavior 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

An introduction to comparative animal behavior and behavioral physiology in an evolutionary context, including but not limited to analysis of behavior, genetics and development, learning, aggression, reproduction, adaptiveness, and physiological substrates.

Animal Behavior: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A, 1B, or Environmental Science, Policy, and Management 140. Molecular and Cell Biology 140 and C160 recommended

**Credit Restrictions:** Students will receive no credit for 144 after taking C144, 145, 146LF, or Psychology C115B.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Lacey, Caldwell, Bentley, Elias

**Also listed as:** ESPM C126

Animal Behavior: Read Less [-]

## INTEGBI C145 Animal Communication 3 Units

Terms offered: Spring 2018

Communication is central to the lives of most, if not all animals. How and why animals communicate is thus central to understanding the ecology, behavior, neurobiology, and evolution of animal systems.

This course will focus on understanding the basic principles driving the communication system of a species, drawing together topics ranging from the physical properties of the environment, physiology of sensory systems, animal behavior and ecology, using examples from classic and recent publications.

Animal Communication: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1B. Animal Behavior (ESPM C126/IB C144) recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Elias

**Formerly known as:** Environ Sci, Policy, and Management 156

**Also listed as:** ESPM C156

Animal Communication: Read Less [-]

## INTEGBI 146LF Behavioral Ecology with Laboratory 5 Units

Terms offered: Spring 2017, Spring 2015, Spring 2013

An in-depth examination of the ecological and evolutionary bases for behavioral diversity. Topics covered include behavior as an adaptive response, sexual selection, animal mating systems, group living, and cooperative and competitive interactions. Current conceptual approaches to these topics are explored, with an emphasis upon rigorous testing of hypotheses drawn from primary literature. Hands-on laboratory training in the methods of experimental design, data collection, and data analysis.

Behavioral Ecology with Laboratory: Read More [+]

### Rules & Requirements

**Prerequisites:** Integrative Biology 144 or Integrative Biology C144/ Environmental Science, Policy and Management C126 or consent of instructor

**Credit Restrictions:** Students will receive partial credit for Integrative Biology 146LF after taking Integrative Biology 146.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture, 1 hour of discussion, and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Lacey

**Formerly known as:** 146L

Behavioral Ecology with Laboratory: Read Less [-]

## INTEGBI 147 Biology of Aging 3 Units

Terms offered: Prior to 2007

This course will focus on studying the molecular mechanisms of aging and the age-related changes that take place in cells and tissues. It introduces animal models used for the study of the genetics and biochemistry of aging as well as discusses the similarities and differences in aging mechanisms across species. Students will learn the age-related changes taking place in the major physiological systems in humans. Special attention will be given to differentiating normal aging processes from diseases that normally affect the elderly.

Biology of Aging: Read More [+]

### Rules & Requirements

**Prerequisites:** BIOLOGY 1A

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Shapira, Caporale

Biology of Aging: Read Less [-]

## INTEGBI 148 Comparative Animal Physiology 3 Units

Terms offered: Fall 2018, Fall 2016, Fall 2014

Comparative study of physiological systems among animal phyla. General physiological principles will be illustrated by examining variation in neural, muscular, endocrine, cardiovascular, respiratory, digestive, and osmoregulatory systems. Students will read original literature and give a group presentation in a symposium.

Comparative Animal Physiology: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B

**Credit Restrictions:** Students will receive no credit for 148 after taking 100A.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Full, Dudley

Comparative Animal Physiology: Read Less [-]

## INTEGBI C149 Molecular Ecology 4 Units

Terms offered: Spring 2010, Spring 2008, Spring 2005

This course focuses on the use of molecular genetic information in ecology. Applications and techniques covered range from analysis of parentage and relatedness (DNA fingerprinting and multilocus genetic analysis) through gene flow, biogeographic history and community composition (comparative DNA sequencing) to analysis of diet and trophic interactions (biological isotopes). Grades are based on one final exam, problem sheets, and a critique of a recent research paper.

Molecular Ecology: Read More [+]

### Rules & Requirements

**Prerequisites:** C163, 161, or Molecular and Cell Biology C142 (may be taken concurrently), or consent of instructor

**Credit Restrictions:** Students will receive no credit for C149 if they took 149 prior to spring 2003.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Formerly known as:** 149

**Also listed as:** ESPM C149

Molecular Ecology: Read Less [-]



## INTEGBI 150 Evolutionary Environmental Physiology 3 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

Evolutionary physiology studies how physiological traits arise and are modified during adaptation to the environment. An integrative understanding of the origin and maintenance of physiological traits, encompassing levels of biological hierarchy from molecular to ecological and biogeographic, is essential for improving human health and stewarding the natural world through the current era of rapid environmental change. This course consists of three parts: 1) big questions in evolutionary physiology and how they are addressed; 2) a student-led exploration of how environmental factors have shaped physiological evolution; and 3) predicting responses to global change using evolutionary physiology.

Evolutionary Environmental Physiology: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B or equivalent

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Williams

Evolutionary Environmental Physiology: Read Less [-]

## INTEGBI 151 Plant Physiological Ecology 4 Units

Terms offered: Spring 2018, Spring 2015, Spring 2013

This course focuses on a survey of physiological approaches to understanding plant-environment interactions from the functional perspective. Lectures cover physiological adaptation; limiting factors; resources acquisition/allocation; photosynthesis, carbon, energy balance; water use and relations; nutrient relations; linking physiology; stable isotope applications in ecophysiology; stress physiology; life history and physiology; evolution of physiological performance; physiology population, community, and ecosystem levels.

Plant Physiological Ecology: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A,1B, or equivalent

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Dawson

Plant Physiological Ecology: Read Less [-]

## INTEGBI 151L Plant Physiological Ecology Laboratory 2 Units

Terms offered: Spring 2018, Spring 2015, Spring 2013

The laboratory is focused on instructing you on observational and experimental approaches and methods used in plant physiological ecology. Students are introduced to a wide range of techniques and will make measurements on different plant species growing in the field or greenhouse (weeks 1-7). A group research project is required (weeks 9-12).

Plant Physiological Ecology Laboratory: Read More [+]

### Rules & Requirements

**Prerequisites:** Concurrent enrollment in 151

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Dawson

Plant Physiological Ecology Laboratory: Read Less [-]

## INTEGBI 152 Environmental Toxicology 4 Units

Terms offered: Spring 2016, Spring 2015, Spring 2014

The environmental fate and effect of toxic substances from human activities, with emphasis on aquatic systems, including their biological effects from the molecular to the community level. Course will review pollutant types, principal sources, impacts on aquatic organisms, monitoring approaches, and regulatory issues.

Environmental Toxicology: Read More [+]

### Rules & Requirements

**Prerequisites:** Background in biology or chemistry is recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Weston

Environmental Toxicology: Read Less [-]

## INTEGBI 153 Ecology 3 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

Principles of microbial, animal, and plant population ecology, illustrated with examples from marine, freshwater, and terrestrial habitats. Consideration of the roles of physical and biological processes in structuring natural communities. Observational, experimental, and theoretical approaches to population and community ecology will be discussed. Topics will include quantitative approaches relying on algebra, graph analysis, and elementary calculus. Discussion section will review recent literature in ecology.

Ecology: [Read More](#) [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Ackerly

Ecology: [Read Less](#) [\[-\]](#)

## INTEGBI 154 Plant Ecology 3 Units

Terms offered: Fall 2017, Fall 2015, Fall 2013

An introduction to ecology of plants, covering individuals, populations, communities, and global processes. Topics include: form and function, population ecology, life histories, community structure and dynamics, disturbance and succession, diversity and global change.

Plant Ecology: [Read More](#) [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B. Enrollment in accompanying lab course 154L is encouraged but not required

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Ackerly

Plant Ecology: [Read Less](#) [\[-\]](#)

## INTEGBI 154L Plant Ecology Laboratory 2 Units

Terms offered: Fall 2015, Fall 2013, Spring 2005

Field and laboratory class in plant ecology. Laboratory exercises covering plant functional morphology, dispersal ecology, spatial dispersion in plant populations, environmental gradients and plant distributions, population dynamics simulations, and restoration ecology. Small-group independent projects, with write-ups and presentations. Concurrent enrollment in Integrative Biology 154 is required.

Plant Ecology Laboratory: [Read More](#) [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B. Concurrent enrollment in 154

### Hours & Format

**Fall and/or spring:** 15 weeks - 4 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Ackerly

Plant Ecology Laboratory: [Read Less](#) [\[-\]](#)

## INTEGBI C155 Holocene Paleoecology: How Humans Changed the Earth 3 Units

Terms offered: Fall 2018, Spring 2014, Spring 2011, Spring 1998

Since the end of the Pleistocene and especially with the development of agriculturally based societies humans have had cumulative and often irreversible impacts on natural landscapes and biotic resources worldwide. Thus "global change" and the biodiversity crisis are not exclusively developments of the industrial and post-industrial world. This course uses a multi-disciplinary approach, drawing upon methods and data from archaeology, palynology, geomorphology, paleontology, and historical ecology to unravel the broad trends of human ecodynamics over the past 10,000 years.

Holocene Paleoecology: How Humans Changed the Earth: [Read More](#) [\[+\]](#)

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Kirch

**Also listed as:** ANTHRO C129D

Holocene Paleoecology: How Humans Changed the Earth: [Read Less](#) [\[-\]](#)

## INTEGBI C156 Principles of Conservation Biology 4 Units

Terms offered: Fall 2018, Summer 2018 Second 6 Week Session, Fall 2017

A survey of the principles and practices of conservation biology. Factors that affect the creation, destruction, and distribution of biological diversity at the level of the gene, species, and ecosystem are examined. Tools and management options derived from ecology and evolutionary biology that can recover or prevent the loss of biological diversity are explored.

Principles of Conservation Biology: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B or equivalent

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1.5 hours of discussion per week

**Summer:** 6 weeks - 6.5 hours of lecture and 3 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Beissinger

**Also listed as:** ESPM C103

Principles of Conservation Biology: Read Less [-]

## INTEGBI 157LF Ecosystems of California 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

The ecosystems of California are studied from both an ecological and historical biogeographical perspective with a focus on terrestrial plant communities. Students learn how to identify about 150 species of native plants (mostly trees, but also other dominant plants from the non-forest biomes). Field trips occur each Friday and over several weekends. Students conduct group projects that involve plant inventories and data collection as well as how to collect plant specimens and use the Herbarium.

Ecosystems of California: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1B or consent of instructor

### Hours & Format

**Fall and/or spring:** 15 weeks - 6 hours of fieldwork and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Fine

Ecosystems of California: Read Less [-]

## INTEGBI 158LF Biology and Geomorphology of Tropical Islands 13 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

Natural history and evolutionary biology of island terrestrial and freshwater organisms, and of marine organisms in the coral reef and lagoon systems will be studied, and the geomorphology of volcanic islands, coral reefs, and reef islands will be discussed. Features of island biogeography will be illustrated with topics linked to subsequent field studies on the island of Moorea (French Polynesia).

Biology and Geomorphology of Tropical Islands: Read More [+]

### Hours & Format

**Fall and/or spring:** 15 weeks - 12 hours of lecture and 6 hours of fieldwork per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Also listed as:** ESPM C107

Biology and Geomorphology of Tropical Islands: Read Less [-]

## INTEGBI 159 The Living Planet: Impact of the Biosphere on the Earth System 3 Units

Terms offered: Fall 2015, Fall 2013, Fall 2011

Earth is a complex dynamic system. Interplay between its components (solid earth, oceans, and atmosphere) governs conditions on the planet's outside that we and other biota inhabit. In turn, life asserts a vast influence on the abiotic components; in fact, the biosphere itself is a crucial system component. We will explore the effect that 3.5 billion years of evolving biosphere had on System Earth and vice versa (e.g., in terms of climate), including the recent human impact on the system.

The Living Planet: Impact of the Biosphere on the Earth System: Read More [+]

### Rules & Requirements

**Prerequisites:** Biology 1B or consent of instructor

**Credit Restrictions:** Students will receive two units of credit after taking Earth and Planetary Science 8, Earth and Planetary Science C141/Geography C141, or Geography 40.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Looy, Duijnste

The Living Planet: Impact of the Biosphere on the Earth System: Read Less [-]

## INTEGBI 160 Evolution 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

An analysis of the patterns and processes of organic evolution. History and philosophy of evolutionary thought; the different lines of evidence and fields of inquiry that bear on the understanding of evolution. The major features and processes of evolution through geologic times; the generation of new forms and new lineages; extinction; population processes of selection, adaptation, and other forces; genetics, genomics, and the molecular basis of evolution; evolutionary developmental biology; sexual selection; behavioral evolution; applications of evolutionary biology to medical, agricultural, conservational, and anthropological research.

Evolution: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Padian, Specht

Evolution: [Read Less](#) [-]

## INTEGBI 161 Population and Evolutionary Genetics 4 Units

Terms offered: Spring 2017, Spring 2015, Spring 2013

Population genetics provides the theoretical foundation for modern evolutionary thinking. It also provides a basis for understanding genetic variation within populations. We will study population genetic theory and use it to illuminate a number of different topics, including the existence of sex, altruism and cooperation, genome evolution speciation, and human genetic variation and evolution.

Population and Evolutionary Genetics: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A/1B, Mathematics 16A or 10A

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Nielson, Slatkin

Population and Evolutionary Genetics: [Read Less](#) [-]

## INTEGBI 162 Ecological Genetics 4 Units

Terms offered: Fall 2016, Fall 2014, Fall 2010

This course integrates ecology, genetics, and evolutionary biology. It presents contemporary approaches to studying evolution in natural populations, including analyzing heritability of ecologically important traits, using molecular techniques to decompose genotypes, documenting and measuring the magnitude of selection in natural systems, and using models to predict evolution in natural populations. Case studies are used to examine evolutionary effects of ecological interactions among organisms, the importance of population size and structure, and interactions among populations through migration and dispersal.

Ecological Genetics: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Simms

Ecological Genetics: [Read Less](#) [-]

## INTEGBI 163 Molecular and Genomic Evolution 3 Units

Terms offered: Spring 2012, Spring 2011, Spring 2010

This course will introduce undergraduates to the study of evolution using molecular and genomic methods. Topics included will be rates of evolution, evolution of sex chromosomes, insertions and deletions of DNA sequences, evolution of regulatory genetic elements, methods of phylogenetic inference, gene duplication, multigene families, transposons, genome organization, gene transfer, and DNA polymorphism within species.

Molecular and Genomic Evolution: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Bachtrog, Slatkin

Molecular and Genomic Evolution: [Read Less](#) [-]

## INTEGBI 164 Human Genetics and Genomics 4 Units

Terms offered: Fall 2018, Fall 2017, Fall 2016

This course will introduce students to basic principles of genetics, including transmissions genetics, gene regulation, pedigree analysis, genetic mapping, population genetics, and the principles of molecular evolution. The course will also introduce students to recent developments in genomics as applied to problems in human genetic diseases, human history, and the relationship between humans and their closest relatives.

Human Genetics and Genomics: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A, 1B, and Math 16A, or equivalent

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 2 hours of laboratory per week

**Summer:** 8 weeks - 6 hours of lecture and 4 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Bachtrog, Nielsen, Slatkin

Human Genetics and Genomics: [Read Less](#) [-]

## INTEGBI C166 Biogeography 4 Units

Terms offered: Fall 2018

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services., Terms offered: Not yet offered

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services.

Biogeography: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** BIO 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Gillespie

**Also listed as:** ESPM C125/GEOG C148

Biogeography: [Read Less](#) [-]

## INTEGBI C166 Biogeography 4 Units

Terms offered: Fall 2018

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services. Terms offered: Not yet offered

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services.

Biogeography: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** BIO 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Gillespie

**Also listed as:** ESPM C125/GEOG C148

Biogeography: [Read Less](#) [-]

## INTEGBI C166 Biogeography 4 Units

Terms offered: Fall 2018

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services. Terms offered: Not yet offered

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services.

Biogeography: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** BIO 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Gillespie

**Also listed as:** ESPM C125/GEOG C148

Biogeography: [Read Less](#) [-]



## INTEGBI C166 Biogeography 4 Units

Terms offered: Fall 2018

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services. Terms offered: Not yet offered

The course will provide a historical background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. It will also discuss developing technologies (including genomic tools and environmental models) together with the availability of big data and increasingly sophisticated analytical tools to examine the relevance of the field to global change biology, conservation, and invasion biology, as well as sustainable food systems and ecosystem services.

Biogeography: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** BIO 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Gillespie

**Also listed as:** ESPM C125/GEOG C148

Biogeography: Read Less [\[-\]](#)

## INTEGBI 167 Evolution and Earth History: From Genes to Fossils 4 Units

Terms offered: Spring 2018, Spring 2016, Spring 2014

The diversity of life is the product of evolutionary changes. This course will integrate fossil and molecular data to consider some of the outstanding questions in the study of evolution. Major topics covered include the origin and early evolution of life, the expansion of the biosphere through time, the generation of variation and the mechanisms of natural selection, genetics and developmental evolution, and the relationships between microevolution and macroevolution.

Evolution and Earth History: From Genes to Fossils: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A, 1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Finnegan, Patel

Evolution and Earth History: From Genes to Fossils: Read Less [\[-\]](#)

## INTEGBI 168 Systematics of Vascular Plants 2 Units

Terms offered: Spring 2010, Spring 2009, Spring 2007

A discussion of the philosophy, principles, techniques, and history of botanical systematics. An outline of the major group of vascular plants and their evolution.

Systematics of Vascular Plants: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1A-1B. Must be taken concurrently with 168L

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Baldwin

Systematics of Vascular Plants: Read Less [\[-\]](#)

## INTEGBI 168L Systematics of Vascular Plants with Laboratory 4 Units

Terms offered: Spring 2017, Spring 2016, Spring 2014

A discussion of the philosophy, principles, techniques, and history of botanical systematics. An outline of the major group of vascular plant and their evolution. Laboratory course devoted to a survey on a world-wide basis of the diversity of vascular plant families.

Systematics of Vascular Plants with Laboratory: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1A-1B

**Credit Restrictions:** Students will receive partial credit for 168L after taking 168.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Baldwin

Systematics of Vascular Plants with Laboratory: [Read Less](#) [-]

## INTEGBI 169 Evolutionary Medicine 4 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

This course explores the ways that evolutionary theory, natural selection, drift, genetics, and epigenetics can illuminate our understanding of human health and disease. The course begins with an overview of primate and hominid evolution and human genetic variation. We then evaluate reproductive biology and maternal/child health through an evolutionary lens. We explore how human ecosystem interactions influence diet, metabolic adaptations, hematological adaptations, human microbiome, and human pathogens. We examine evolutionary concepts related to aging, senescence and development of cancer. Finally we study psychology, behavior, and social/cultural organization through an evolutionary perspective.

Evolutionary Medicine: [Read More](#) [+]

### Rules & Requirements

**Prerequisites:** Biology 1B, or equivalent

**Credit Restrictions:** Restricted to Integrative Biology graduating seniors.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

**Summer:** 6 weeks - 8 hours of lecture and 2 hours of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Carlson

Evolutionary Medicine: [Read Less](#) [-]

## INTEGBI 170LF Methods in Population and Community Ecology 3 Units

Terms offered: Spring 2017, Spring 2015

This course is a hands-on introduction to common research methods in population and community ecology. Each method and its application are first presented in a lecture session, illustrated with published examples. The method is then practiced in a subsequent group field exercise, conducted in a local terrestrial, aquatic, or marine habitat.

The course focuses on sampling methods, experimental designs, and statistical analyses used to investigate patterns of species distribution and abundance, interspecific associations, and local species diversity. Graded assignments include write-ups of field exercise results, and an in-depth review paper and oral in-class presentation on an ecological method of particular interest to the student.

Methods in Population and Community Ecology: Read More [a]

### Objectives Outcomes

**Course Objectives:** This course is designed as a hands-on introduction to common research methods in population and community ecology. Students will learn how to quantitatively describe and statistically analyze patterns in (1) the distribution, abundance, and size/age distributions of populations, (2) the diversity and similarity of multi-species assemblages, (3) interspecific association, and (4) habitat preference and selectivity. They will also be taught the fundamentals of experimental design and apply them in a field predator-prey manipulation.

### Rules & Requirements

**Prerequisites:** Integrative Biology 153 or comparable upper-division course in ecology from Integrative Biology or Environmental Science Policy and Management course lists (or by consent of instructor); introductory course in statistics strongly recommended

**Credit Restrictions:** Students will receive no credit for Integrative Biology 170LF after completing Integrative Biology 153L.

### Hours & Format

**Fall and/or spring:** 15 weeks - 8 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Alternative to final exam.

**Instructor:** Sousa

**Formerly known as:** Integrative Biology 153LF

Methods in Population and Community Ecology: Read Less [-]

## INTEGBI C171 Freshwater Ecology 3 Units

Terms offered: Spring 2018

Lakes, rivers, wetlands, and estuaries are biologically rich, dynamic, and among the most vital and the most vulnerable of Earth's ecosystems. Lectures will introduce general topics including the natural history of freshwater biota and habitats, ecological interactions, and ecosystem linkages and dynamics. Broad principles will be illustrated with results from selected recent research publications. Factors affecting resilience or vulnerability of freshwater ecosystems to change will be examined. Course requirements: two exams and a short synthesis paper projecting the future states of a freshwater or estuarine ecosystem of the student's choice under plausible scenarios of local, regional, or global change.

Freshwater Ecology: Read More [a]

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructors:** Power, Carlson, Ruhi

**Formerly known as:** Integrative Biology 171

**Also listed as:** ESPM C115A

Freshwater Ecology: Read Less [-]

## INTEGBI 172 Coevolution: From Genes to Ecosystems 4 Units

Terms offered: Spring 2017

The biological world is shaped by interactions among species. These inter-specific interactions, such as between predators and prey, plants and pollinators, or hosts and pathogens, have led to an impressive array of adaptations, helping to explain the incredible organismal and genetic diversity on Earth. Our understanding of coevolution (the responses to reciprocal selection acting on two interacting populations) has been greatly facilitated in the last few years by conceptual advancements, new methods allowing direct tests of theory, next generation sequencing technology, and the advance of 'omics' approaches.

Coevolution: From Genes to Ecosystems: Read More [a]

### Rules & Requirements

**Prerequisites:** Bio 1A and Bio 1B or equivalent required, Genetics or Evolution course suggested

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Koskella

Coevolution: From Genes to Ecosystems: Read Less [-]

## INTEGBI 173LF Mammalogy with Laboratory 5 Units

Terms offered: Fall 2018, Fall 2016, Fall 2014

An advanced course in the biology of mammals. Topics covered include elements of modern mammalian biology such as morphology, physiology, ecology, and behavior. For all topics, the traits that define mammals are emphasized, as is the variation on these themes evident within modern mammalian lineages. Laboratory and field explore the biology of modern mammals. Laboratories use the extensive collections of the Museum of Vertebrate Zoology to introduce students to mammalian diversity in a phylogenetic context.

Mammalogy with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 104LF

**Credit Restrictions:** Students will receive partial credit for 173LF after taking 173.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Nachman

Mammalogy with Laboratory: Read Less [\[-\]](#)

## INTEGBI 174LF Ornithology with Laboratory 4 Units

Terms offered: Spring 2017, Spring 2015, Spring 2013

An advanced course in the biology of birds. Laboratory: an introduction to the diversity, morphology, and general ecology of birds of the world.

Ornithology with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 104LF or consent of instructor

**Credit Restrictions:** Students will receive partial credit for 174LF after taking 174.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Bowie

Ornithology with Laboratory: Read Less [\[-\]](#)

## INTEGBI 175LF Herpetology with Laboratory 4 Units

Terms offered: Spring 2018, Spring 2015, Spring 2013

Lectures will introduce students to the diversity of amphibians and reptiles on a world-wide basis, with an emphasis on systematics, ecology, morphology, and life history. Laboratories will teach students the diagnostic characteristics and some functional attributes of amphibians and reptiles on a world-wide basis. Field trips will acquaint students with techniques for collecting, preserving, identifying, and studying amphibians and reptiles.

Herpetology with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** 104LF

**Credit Restrictions:** Students will receive partial credit for 175LF after taking 175.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 4 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** McGuire

Herpetology with Laboratory: Read Less [\[-\]](#)

## INTEGBI C176L Fish Ecology 3 Units

Terms offered: Spring 2018, Spring 2017, Spring 2015

Introduction to fish ecology, with particular emphasis on the identification and ecology of California's inland fishes. This course will expose students to the diversity of fishes found in California, emphasizing the physical (e.g., temperature, flow), biotic (e.g., predation, competition), and human-related (e.g., dams, fisheries) factors that affect the distribution, diversity, and abundance of these fishes.

Fish Ecology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Introductory course in biological science; upper division or graduate standing

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Carlson

**Also listed as:** ESPM C115C

Fish Ecology: Read Less [\[-\]](#)

## INTEGBI 177LF Ichthyology 4 Units

Terms offered: Prior to 2007

We will study the anatomy, physiology, life history, diversity, evolution, behavior, biogeography and ecology of the fishes, the most diverse of all vertebrate groups and the dominant group of vertebrates in aquatic habitats. Aside from serving as a comprehensive introduction to the science of ichthyology, the course will provide a solid foundation in anatomy, physiology, evolution, life history, and ecology and will prepare you well for careers in fisheries science, ichthyology, aquaculture, oceanography or vertebrate biology.

Ichthyology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Bio 1B prerequisite. Students are encouraged to enroll concurrently or subsequently in IB C176L (Fish Ecology)

### Hours & Format

**Summer:** 6 weeks - 8 hours of lecture and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Ichthyology: Read Less [\[-\]](#)

## INTEGBI 181L Paleobotany - The 500-Million Year History of a Greening Planet 4 Units

Terms offered: Spring 2018, Spring 2016, Fall 2014

Introduction to the evolution of plants and terrestrial ecosystems through time. From the invasion of land to the present, we will follow the evolution of major plant groups through important moments of the Phanerozoic eon (the past 540 million years). By studying fossilized plant assemblages, we will interpret how major environmental changes unfolded across landscapes in the past and how plants have influenced the shaping of our planet. Lectures will be complemented by an interactive laboratory covering paleobotanical research techniques, study of fossil and living plant form and function in the lab and field, and analysis of peer-reviewed literature.

Paleobotany - The 500-Million Year History of a Greening Planet: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Courses in botany and geology are recommended

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Looy

**Formerly known as:** Integrative Biology 181

Paleobotany - The 500-Million Year History of a Greening Planet: Read Less [\[-\]](#)

## INTEGBI 183L Evolution of the Vertebrates with Laboratory 4 Units

Terms offered: Spring 2015, Spring 2013, Spring 2011

Introduction to vertebrate paleontology, focusing on the history and phylogeny of vertebrates ranging from fishes to humans. Emphasis: evolution, taxonomy, functional morphology, faunas through time, problems in vertebrate history, including diversity through time and extinction. Laboratory: vertebrate fossils, focusing on demonstration and study of problems related to taxonomy, evolution, functional morphology, structures, preservation of fossil vertebrates, and their faunas through time.

Evolution of the Vertebrates with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B; introductory courses in earth history and zoology are recommended

**Credit Restrictions:** Students will receive partial credit for 183L after taking 183.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 2 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Padian

Evolution of the Vertebrates with Laboratory: Read Less [\[-\]](#)

## INTEGBI 184L Morphology of the Vertebrate Skeleton with Laboratory 4 Units

Terms offered: Spring 2015, Fall 2012, Fall 2010

Lectures on comparative osteology of vertebrates, with emphasis on selected groups of terrestrial vertebrates considered in paleoecological, paleoclimatological, and biostratigraphic analyses. Laboratory: comparative osteology of vertebrates, with emphasis on selected groups of vertebrates. Structure, anatomy, morphology, function, and development of the vertebrate skeleton.

Morphology of the Vertebrate Skeleton with Laboratory: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B or introductory courses in Earth Sciences or Anthropology

**Credit Restrictions:** Students will receive partial credit for 184L after taking 184.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of lecture, 1 hour of discussion, and 6 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Barnosky

Morphology of the Vertebrate Skeleton with Laboratory: Read Less [\[-\]](#)

## INTEGBI C185L Human Paleontology 5 Units

Terms offered: Spring 2017, Spring 2015, Spring 2013

Origin and relationships of the extinct forms of mankind.

Human Paleontology: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Anthropology 1, Biology 1A-1B

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture and 3 hours of laboratory per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** White

**Also listed as:** ANTHRO C100

Human Paleontology: Read Less [\[-\]](#)



## INTEGBI C187 Human Biogeography of the Pacific 3 Units

Terms offered: Spring 2015, Spring 2013

This course examines the history of human dispersal across Oceania from the perspectives of biogeography and evolutionary ecology. H. sapiens faced problems of dispersal, colonization, and extinction, and adapted in a variety of ways to the diversity of insular ecosystems. A dual evolutionary model takes into account cultural evolution and transmission, as well as biological evolution of human populations. This course also explores the impacts of human populations on isolated and fragile insular ecosystems, and the reciprocal effects of anthropogenic change on human cultures.

Human Biogeography of the Pacific: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Biology 1B strongly recommended, or evidence the student has mastered an equivalent set of basic concepts in evolution and ecology

### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Kirch

**Also listed as:** ANTHRO C124C

Human Biogeography of the Pacific: Read Less [\[-\]](#)

## INTEGBI 190 Seminar for Integrative Biology Majors 1 - 3 Units

Terms offered: Spring 2016, Spring 2015, Spring 2014

This upper-division undergraduate course will allow students to pursue specialized topics in biology in a seminar format. The specific content of the course will vary based on the topic and the instructor. In general, weekly meetings will provide a forum for extended discussion of selected aspects of evolutionary biology. Supplementary readings and assignments will provide critical background information and keep students engaged in relevant topics between weekly meetings.

Seminar for Integrative Biology Majors: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-3 hours of seminar per week

### Summer:

6 weeks - 2.5-7.5 hours of seminar per week

8 weeks - 1.5-5.5 hours of seminar per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Seminar for Integrative Biology Majors: Read Less [\[-\]](#)

## INTEGBI 191 Directed Undergraduate Research 3 Units

Terms offered: Spring 2017, Fall 2016, Summer 2015 10 Week Session

This course is intended for advanced undergraduates wishing to pursue independent research projects under the mentorship of an IB faculty member. Research projects will be rigorous and will provide significant training in the methods of evolutionary research. A project proposal is required to enroll and students are expected to produce a substantial written summary of their work.

Directed Undergraduate Research: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of instructor and departmental adviser

### Hours & Format

**Fall and/or spring:** 15 weeks - 9 hours of independent study per week

### Summer:

8 weeks - 17 hours of independent study per week

10 weeks - 13.5 hours of independent study per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

Directed Undergraduate Research: Read Less [\[-\]](#)

## INTEGBI 194 Undergraduate Student Instructor for Integrative Biology Courses 1 - 3 Units

Terms offered: Fall 2016, Spring 2016, Fall 2015

UGSI will work under supervision of instructor and/or GSI. The UGSI will attend any mandatory preparatory and review meetings, be available in the classroom (discussion or laboratory) to respond to student questions, facilitate lesson plans, perform other tasks as assigned. UGSIs do not evaluate students' work or assign grades.

Undergraduate Student Instructor for Integrative Biology Courses: Read More [+]

### Rules & Requirements

**Prerequisites:** Must have completed course applying to UGSI with a grade of B or better; or consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 3-4 hours of lecture per week

### Summer:

6 weeks - 8-10 hours of lecture per week

8 weeks - 6-8 hours of lecture per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Undergraduate Student Instructor for Integrative Biology Courses: Read Less [-]

## INTEGBI C195 Introduction to Global Health Disparities Research 2 Units

Terms offered: Spring 2018, Spring 2017, Spring 2016

This course is designed to prepare trainees in the UC Berkeley "Minority Health/Global Health" (MH/GH) program to conduct a ten-week infectious disease research project in a disease-endemic country. The course provides a background in neglected tropical disease research, international research ethics, and the conduct of health research in low-resource settings.

Introduction to Global Health Disparities Research: Read More [+]

### Hours & Format

**Fall and/or spring:** 15 weeks - 1 hour of lecture and 1 hour of discussion per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam required.

**Instructor:** Reingold

**Also listed as:** PB HLTH C117

Introduction to Global Health Disparities Research: Read Less [-]

## INTEGBI H196A Thesis Course 3 Units

Terms offered: Fall 2016, Fall 2013, Fall 2012

Individual study and research for at least one academic year on a special problem to be chosen in consultation with a member of the staff; preparation of the thesis on broader aspects of this work.

Thesis Course: Read More [+]

### Rules & Requirements

**Prerequisites:** Open only to students in Honors Program

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Summer:

6 weeks - 0 hours of independent study per week

8 weeks - 0 hours of independent study per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Thesis Course: Read Less [-]

## INTEGBI H196B Thesis Course 3 Units

Terms offered: Spring 2014, Fall 2013, Spring 2013

Individual study and research for at least one academic year on a special problem to be chosen in consultation with a member of the staff; preparation of the thesis on broader aspects of this work.

Thesis Course: Read More [+]

### Rules & Requirements

**Prerequisites:** Open only to students in Honors Program

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Summer:

6 weeks - 0 hours of independent study per week

8 weeks - 0 hours of independent study per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Letter grade. Final exam not required.

Thesis Course: Read Less [-]

## INTEGBI 197 Supervised Internship 1 - 4 Units

Terms offered: Fall 2016, Spring 2015, Spring 2014

Supervised experience relevant to specific topics of biology in off-campus organizations. Written report and evaluation from internship supervisor required.

Supervised Internship: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Consent of Integrative Biology faculty sponsor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of fieldwork per week

#### Summer:

6 weeks - 1-4 hours of fieldwork per week

8 weeks - 1-4 hours of fieldwork per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Supervised Internship: Read Less [\[-\]](#)

## INTEGBI 198 Supervised Group Study and Research By Upper Division Students 1 - 4 Units

Terms offered: Fall 2018, Spring 2017, Spring 2016

Undergraduate research by small groups.

Supervised Group Study and Research By Upper Division Students: Read More [\[+\]](#)

### Rules & Requirements

**Credit Restrictions:** Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of directed group study per week

#### Summer:

6 weeks - 2.5-10 hours of directed group study per week

8 weeks - 2-7.5 hours of directed group study per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Supervised Group Study and Research By Upper Division Students: Read Less [\[-\]](#)

## INTEGBI 199 Supervised Independent Study and Research 1 - 4 Units

Terms offered: Fall 2016, Summer 2016 10 Week Session, Spring 2014

Enrollment restrictions apply; see department.

Supervised Independent Study and Research: Read More [\[+\]](#)

### Rules & Requirements

**Prerequisites:** Background courses in chosen subjects

**Credit Restrictions:** Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 1-4 hours of independent study per week

#### Summer:

6 weeks - 2.5-10 hours of independent study per week

8 weeks - 2-7.5 hours of independent study per week

10 weeks - 1.5-6 hours of independent study per week

### Additional Details

**Subject/Course Level:** Integrative Biology/Undergraduate

**Grading/Final exam status:** Offered for pass/not pass grade only. Final exam not required.

Supervised Independent Study and Research: Read Less [\[-\]](#)