

Fall 2024 IB 104 Animal Biology

Course syllabus

Course information

Course website: IB 104 F24 Canvas site at learn.illinois.edu

Lecture Time: 11-11:50 am MWF

Location: 2100 Sidney Lu Mechanical Engineering Bldg.

Credit: 4 hours

Contact hours: 6 (3 lecture hours plus 3 lab hours)

Lectures and labs meet in person.

This course satisfies the General Education Criteria for Natural Sciences & Technology - Life Sciences.

Instructor

Dr. Lily Arias

3010 NHB

larias@illinois.edu

Student hours: By appointment in 3010 NHB

Teaching Assistants

Austin Coulter - Lecture and lab TA

Email: agc6@illinois.edu

Lab sections: ABE

Student hours: Fridays 8-9 am, 2082 NHB

Morgan Brown - Lab TA

Email: mbrown18@illinois.edu

Lab sections: ABD, ABM

Student hours: Monday 12-2 pm, 2082 NHB

Please note that the information in this syllabus may be subject to change. Students will be notified in advance of any changes.

Required textbook and materials

1. Video links are available for every lecture.

2. Biology 2e, Clark, Choi, Douglas 2018. OpenStax. Rice University. Publish Date: Mar 28, 2018. Web Version Last Updated: Aug 31, 2020. **Free-access textbook:** [Link to textbook](#) View online or download PDF.

3. Lab handouts will be available in Moodle each week.

Introduction to IB 104 Animal Biology

Animal Biology is an introductory biology course that emphasizes the application of the scientific method to all disciplines of biology and the development of graphic and critical thinking skills. The course is taught in a manner in which we begin with basic scientific principles and as the semester progresses, we discover how all disciplines of biology are interconnected. In Unit 1, we focus on the scientific method which is the unifying concept for all the subjects covered in the class. Here, we also study cell biology, including the transmission of genetic information across generations. In Unit 2, the principles of evolution help us understand life diversity, more specifically, animal diversity. In Unit 3, we study how anatomy relates to physiology (form and function) and the different ecological levels, including how these levels can be affected by habitat degradation, invasive species, and climate change.

Student learning outcomes

- Understand the fundamentals of cell biology, animal anatomy, physiology, genetics, evolution, diversity, ecology, and behavior.
- Understand that critical thinking is the basis of the scientific method.
- Use critical thinking skills to solve diverse problems and to be able to support their decision.
- Understand the steps of the scientific method and apply them to evaluate biological processes and situations occurring in our daily lives.
- Evaluate and distinguish between true and false information related to science displayed on the news or social media.
- Make use of quantitative skills to run computer simulations on evolutionary mechanisms.
- Apply quantitative skills to collect and process data and to plot different types of graphs and to analyze data collected by scientists and published in the scientific literature.
- Being able to collaborate with classmates to complete activities and prepare group projects.
- Take control of their own learning.
- Become familiar with common lab techniques.
- Become familiar with common species of vertebrates and invertebrates found in Illinois.

Course structure

The course for the most part follows a flipped-classroom approach. Students must watch selected videos before coming to class. Time in class will be used to review main points and to apply concepts learned to solve challenging problems. Lectures are interactive and require student participation. The diversity lectures will follow a traditional style. Labs correspond to lecture material.

IB 104 is a four-hour credit course, and it contains both lecture and lab components. Students are expected to spend 8 hours per week outside of class working on lecture and lab materials. Actual time commitments will vary depending on your input, needs, and personal study habits.

Course components

Quizzes

Students will watch assigned videos before coming to class. Pre-lecture quizzes evaluate student's preparation with basic questions. Quizzes close before class starts. Each pre-lecture quiz is worth 7 points. Two lowest scores will be dropped.

In-lecture participation

There will be activities and/or questions in every lecture. To complete these activities, you will work individually or in small groups. Each participation quiz is worth 5 points. Six lowest scores will be dropped.

Exams

There will be 3 lecture exams, each worth 100 points. Exams will cover lecture material, including quizzes and videos. Students with conflicts or personal emergencies must provide proper documentation to take a make-up exam. Exams are not cumulative.

Final exam

The final exam is cumulative and optional, only for students that wish to improve their grades. The final exam grade will replace the average of the three semester exam scores.

Labs

There will be 13 weekly labs. Each week, there will be a combination of individual and group activities. Each lab worksheet is worth 20 points. There will be two quizzes during the semester, each one worth 20 points. The semester-long project (last lab of the semester) is a collaboration with students from Peru.

Grade distribution

The lecture component comprises 70% of your final grade, and the laboratory component comprises 30%. Grades won't be curved.

Course Component	Points	Percent
In-lecture participation (37 lecture activities x 5 pts. each, six lowest scores are dropped)	155	15.5
Pre-lecture quizzes (37 quizzes x 7 pts. each, two lowest scores are dropped)	245	24.5
Exam 1	100	10.00
Exam 2	100	10.00
Exam 3	100	10.00
Labs	300	30.00
Course Total	1000	100.00
Lab component	Points	Percent
Weekly activities (13 labs x 20 pts. each)	260	26
Lab quizzes (2 quizzes x 20 pts. each)	40	4
Lab Total	300	30%

Grading scale

Percentage	Letter Grade	Percentage	Letter Grade
97-100	A+	77-79.5	C+
94-96.5	A	74-76.5	C
90-93.5	A-	70-73.5	C-
87-89.5	B+	67-69.5	D+
84-86.5	B	64-66.5	D
80-83.5	B-	60-63.5	D-

Lecture and lab schedule

Please note that this schedule is subject to change. Students will be notified in advance of any changes							
Unit	Week	Date	Day	Lecture subject	Lecture #	Lecture topic	Labs
Unit 1	1	Aug 26	M	Cell biology	1	Intro to the course. Eukaryotic cells: Plasma membrane/Transport	
		Aug 28	W	Cell biology	2	Eukaryotic cells: Organelles. Energy, ATP	
		Aug 30	F	Cell biology	3	Cellular Respiration	
	2	Sep 2	M	Genetics		No class: Labor day	Lab 1.- Scientific method.
		Sep 4	W	Genetics	4	DNA structure, function, and replication	
		Sep 6	F	Genetics	5	Central dogma: Transcription and translation. Mutations	
	3	Sep 9	M		6	Mitosis	Lab 2.- Lab techniques. Microscopy and Micropipetting
		Sep 11	W	Genetics	7	Meiosis	
		Sep 13	F	Genetics	8	Mendelian Genetics	
	4	Sep 16	M	Genetics	9	Modern genetics and human genetic disorders	Lab 3.- Genetics. PTC test part 1
		Sep 18	W	Genetics		Review	
		Sep 20	F			Exam 1	
Unit 2	5	Sep 23	M	Evolution	10	Evolution of Populations/Mechanisms of Evolution	Lab 4.- Genetics. PTC test part 2. Mitosis. [Student survey: lecture]
		Sep 25	W	Evolution	11	Natural Selection/Adaptive Evolution	
		Sep 27	F	Evolution	12	Speciation	
	6	Sep 30	M	Evolution	13	Phylogenies and the history of life	Lab 5.- Genetics. Meiosis
		Oct 2	W	Evolution	14	Intro to animal diversity	
		Oct 4	F	Animal diversity	15	Animal Diversity: Porifera & Cnidaria	
	7	Oct 7	M	Animal diversity	16	Animal Diversity: Flatworms, Annelids, Mollusks	Lab 6.- Evolution: Genetic drift Lab quiz 1 (Labs 1-6)
		Oct 9	W	Animal diversity	17	Animal Diversity: Nematods, Arthropods	
		Oct 11	F	Animal diversity	18	Animal Diversity: Echinoderms/Chordata	
	8	Oct 14	M	Animal diversity	19	Animal Diversity: Vertebrates: Fish	Lab 7.- Evolution. Phylogenetic trees
		Oct 16	W	Animal diversity	20	Animal Diversity: Vertebrates: Amphibians & Reptiles	
		Oct 18	F	Animal diversity	21	Animal Diversity: Vertebrates: Birds	
	9	Oct 21	M	Animal diversity	22	Animal Diversity: Vertebrates: Mammals	Lab 8.- Animal Diversity I: Invertebrates (Global classroom Google doc opens)
		Oct 23	W	Animal diversity		Catch up and Review	
		Oct 25	F			Exam 2	
Unit 3	10	Oct 28	M	Anatomy & Physiology	23	Digestive system	Lab 9.- Animal Diversity II: Fish, Amphibians, Reptiles
		Oct 30	W	Anatomy & Physiology	24	Respiratory system	
		Nov 1	F	Anatomy & Physiology	25	Circulatory system	
	11	Nov 4	M	Anatomy & Physiology	26	Osmotic regulation & Excretion	Lab 10.- Animal Diversity III: Birds, Mammals
		Nov 6	W	Anatomy & Physiology	27	Animal reproduction	
		Nov 8	F	Ecology	28	Organismal Ecology. Scientific Method. Graphs	
	12	Nov 11	M	Ecology	29	Terrestrial and Aquatic biomes	Lab 11.- Ecology, Evolution, Genetics, Physiology: Data nuggets.
		Nov 13	W	Ecology	30	Population Ecology: Population size and distribution	
		Nov 15	F	Ecology	31	Population Ecology: Survivorship curves, life histories	
	13	Nov 18	M	Ecology	32	Community Ecology: Species interactions	Lab 12.- Ecology. Cicadas' natural history. Collecting cicada data
		Nov 20	W	Ecology	33	Community Ecology: Competition	
		Nov 22	F	Ecology	34	Ecosystems: Trophic cascades 1	
		Nov 25	M			No class: Fall break	
		Nov 27	W			No class: Fall break	
		Nov 29	F			No class: Fall break	
	14	Dec 2	M	Ecology	35	Ecosystem Biology: Trophic cascades 2	Lab 13.- Group presentations of semester-long projects. Global classroom second form. Lab quiz 2 (Labs 6-12)
		Dec 4	W	Ecology	36	Conservation & Biodiversity	
		Dec 6	F	Ecology	37	Climate Change	
	15	Dec 9	M	Ecology		Review	No labs
		Dec 11	W			Exam 3	
		TBD	W			Final Exam	Optional

Absences policy

Attendance in lectures and labs is mandatory. Students need to provide documentation that proves that the absence was due to an emergency to make-up in-class lecture participation points. **Documentation needs to show the student's name, day and time of absence, and reason of absence.** See Lab syllabus below for information about absences in the lab.

For official University sponsored absences, students must make arrangements with the lecture and lab TAs prior to the event. Students must provide an official letter from a University instructor or coach. For any other absences, students must request an absence letter from the Student Assistance Center in the Office of the Dean of Students.

The University of Illinois Urbana-Champaign is committed to upholding Illinois law requiring the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to class attendance and the scheduling of examinations and work requirements. Students seeking religious accommodations must complete the Request for Accommodation for Religious Observances form
<https://odos.illinois.edu/community-of-care/resources/students/religious-observances/>

Accommodations will be provided for students who have a religious observance as outlined in the *Student Code*, and [Article 1, Section 1-107 on Religious Beliefs, Observances, and Practices](#).

Inclusivity Statement

The effectiveness of this course is dependent upon the creation of an encouraging and safe classroom environment. Exclusionary, offensive or harmful speech (such as racism, sexism, homophobia, transphobia, etc.) will not be tolerated and in some cases will be subject to university harassment procedures. We are all responsible for creating a positive and safe environment that allows all students equal respect and comfort. I expect each of you to help establish and maintain an environment where you and your peers can contribute without fear of ridicule or intolerant or offensive language.

Student Accommodations

Students with disabilities who require assistance to participate in this class must provide the instructor with the Letter for Academic accommodations drafted by the DRES staff. The instructor will assist with the provision of accommodations when reasonable and necessary. Follow this link to learn more about students accommodations and DRES
<https://www.disability.illinois.edu/academic-supports/accommodations/academic-accommodations>

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, email disability@illinois.edu or go to the DRES website. If you are concerned you have a disability related condition that is impacting your academic progress, there are academic screening appointments available on campus that can help diagnosis a previously undiagnosed disability by visiting the DRES website and selecting "Sign-Up for an Academic Screening" at the bottom of the page. If you are interested in obtaining information to improve writing, study skills, time management or organization, the following campus resources are available to all students: Writer's Workshop Undergrad Library 217-333-8796

Students taking lecture exams at the DRES facilities must schedule them to begin the **same day and time** as the regular exam. If this is not possible, discuss options with the lecture instructor.

Academic Integrity

It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Follow this link to learn what behaviors are considered infractions to the academic integrity policies. <https://studentcode.illinois.edu/article1/part4/1-402/>

Emergency situation

Emergencies can happen anywhere and at any time, so it's important that we take a minute to prepare for a situation in which our safety could depend on our ability to react quickly. Take a moment to learn the different ways to leave this building. If there's ever a fire alarm or something like that, you'll know how to get out and you'll be able to help others get out. Next, figure out the best place to go in case of severe weather – we'll need to go to a low-level in the middle of the building, away from windows. And finally, if there's ever someone trying to hurt us, our best option is to run out of the building. If we cannot do that safely, we'll want to hide somewhere we can't be seen, and we'll have to lock or barricade the door if possible and be as quiet as we can. We will not leave that safe area until we get an Illini-Alert confirming that it's safe to do so. If we can't run or hide, we'll fight back with whatever we can get our hands on. If you want to better prepare yourself for any of these situations, visit police.illinois.edu/safe. Remember you can sign up for emergency text messages at emergency.illinois.edu.

Fall 2024 Lab syllabus

Worksheets

Labs will consist of a combination of individual and group activities.

At the end of each lab, students will hand the completed worksheet to their TA or upload it to Moodle, depending on the week. No worksheets will be accepted after this deadline. Exceptions will be made only in cases where students can **document** that their delay is due to an emergency. In those cases, let your TA know that you need an extension as soon as possible.

Unless otherwise stated, each student must submit a worksheet even if work was done in groups.

Quizzes

There will be two quizzes during the semester. Quizzes will include material that was covered in the lab and will not be cumulative.

For most part, lab activities will follow and complement lecture subjects. Lab quizzes will include topics covered in lab only. Lecture exams will include topics in lecture only. Keep in mind that there may be an overlap in these topics.

Absences

Missed labs can be made up for full credit by attending another section that same week if the TAs for both sections approve it. If a student cannot attend another section that week and if this is a documented emergency (document needs to show students name, date and time, and contact information of person signing the document), they will be allowed to make up the points by completing the worksheet during office hours or alternative options will be provided. Alternatives will require three hours of work, just like a regular lab.

Rules of the laboratory

Students won't be allowed in the lab or points will be deducted if these rules are not followed.

1. Food and drink are not allowed in the laboratories. Keep drinks in your backpacks. You are allowed to drink in the backpack area.
2. Bare feet, flip-flops and sandals are not allowed in the labs that require the use of chemicals (PTC lab); closed-toe shoes are required. Full-length pants or equivalent are required. Students won't be allowed in the lab if this rule is not followed.
3. The use of cell phones is not allowed unless the lab activities require it.
4. Coats (or extra apparel), backpacks, and bags must be stored in the cabinets, on the metal racks, or under the lab benches or chairs.
5. The walking areas must be completely clear.

6. Assume that all chemicals of unknown toxicity are highly toxic.
7. Do not perform any unauthorized experiments. Do not use equipment without instruction.
7. Microscopes and slides must be cleaned and returned to the bench for later sections.
9. The labs must be cleaned by the students after each lab. This includes the lab tables, the sink, and, if necessary, the floor. Use the sponges and paper towels provided. Wipe the lab bench down at the end of every lab. Put away all supplies.
10. Wash your hands with soap before leaving the laboratory.
11. Labs start on time and students are allowed to leave only when the TA dismisses the class.
12. The TAs and the classroom assistant oversee the orderly conduct of labs and may exclude a student who does not comply with a reasonable request in this regard.
13. The TAs and prep staff are not responsible for any student belongings during labs; please bring only the necessary items to labs.