

## **Fall 2023 IB 104 Animal Biology**

### **Course syllabus**

#### **Course information**

Course website: IB 104 F23 Moodle 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](mailto:larias@illinois.edu)

Student hours: Monday and Wednesday, 12-1 pm in 3010 NHB and via Zoom

<https://illinois.zoom.us/j/91782840433?pwd=YVY5c1Rjdk1rMlA2UmZrWTIxaFNadz09>

#### **Teaching Assistants**

Anupama Udayakumar - Lecture and lab TA

Email: [audaya2@illinois.edu](mailto:audaya2@illinois.edu)

Lab sections: ABL

Student hours: W 3-5 pm

Lance Jones - Lab TA

Email: [lanceej2@illinois.edu](mailto:lanceej2@illinois.edu)

Lab sections: ABD, ABH

Student hours: F 9-11 am

Austin Coulter - Lab TA

Email: [agc6@illinois.edu](mailto:agc6@illinois.edu)

Lab sections: ABD, ABM

Student hours: T, R, 5-6 pm

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

## **Required text and materials**

1. Video links are available for every lecture.
2. Supporting material. 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. For the Diversity lectures, quizzes will be given after the lecture. Each quiz is worth 7 points. Three 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 lecture, students will get 5 points for getting the right answer in the activities and 4 points for any other answers. 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. 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 14 weekly labs. Each week, there will be a combination of individual and group activities. Each lab worksheet is worth 15 points. There will be two quizzes during the semester, each one worth 20 points. See "Lab syllabus" at the end of this document for more information.

## **Grade distribution**

The lecture component comprises 70% of your final grade, and the laboratory component comprises 30%. Grades will be rounded up. Lowest quiz, homework, and in-class participation scores are dropped; therefore, grades won't be curved. Extra point assignments won't be given.

<b>Course Component</b>	<b>Points</b>	<b>Percent</b>
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
<b>Lab component</b>	<b>Points</b>	<b>Percent</b>
Weekly activities (14 labs x 15 pts. each)	210	21
Lab quizzes (2 quizzes x 20 pts. each)	40	4
Project: Isopods	30	3
Project: Anatomy of vertebrates	20	2
Lab Total	300	30%

### **Grading scale**

<b>Percentage</b>	<b>Letter Grade</b>	<b>Percentage</b>	<b>Letter Grade</b>
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-

## **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. 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](#).

## **COVID 19 statement**

If you receive a positive test, you will need to email your instructors and let them know you will be absent from class. You do not need to share any specific health information with them. Instructors have access to verified student absence records (without details of what the absence is about).

## **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](mailto: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](http://police.illinois.edu/safe). Remember you can sign up for emergency text messages at [emergency.illinois.edu](http://emergency.illinois.edu).

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

## Fall 2023 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 subjects 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 only if this is **due to a documented emergency** AND if the TAs for both sections approve it. Students need to provide documentation that proves that the absence was due to an emergency. If students cannot attend another lab section that week, they will have the option to attend any TA's office hours to get help in completing the worksheet. Deadline to submit the weekly worksheet will depend on the circumstances. These worksheets can receive **full credit**.

If absence was **not due to an excused, documented situation**, then students should contact their TA to find a spot in another section that same week. If absence cannot be made up, students have the option to attend any TA's office hours to get help in completing the worksheet and submit it. In either case, the worksheet will receive a maximum of **50% of the grade**. Students can only make-up labs due to unexcused absences once during the semester. Deadline to submit the weekly worksheet will be the same as the rest of the class.

Lab material will be on display only from Monday to Friday. If absences due to **documented emergencies** cannot be made up during the week and the material has been put away, TAs will provide other alternatives to the students that will require three hours of work, just like a regular lab.

### COVID 19 statement

If you receive a positive test, you will need to email your instructors and let them know you will be absent from class. You do not need to share any specific health information with them. Instructors have access to verified student absence records (without details of what the absence is about).



## 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.