

IB 202 Physiology

Lecture time: MWF 12-12:50 pm

Location: 112 Gregory Hall

Credit: 4 hours with lab; 3 hours without lab (for non-IB majors)

This is a required course for IB majors but is an optional course for some other majors.

Prerequisites IB 150 and MCB 150

Lecture Information**Instructors:**

Dr. Adam G. Dolezal

Office: 349 Morrill Hall

Email: adolezal@illinois.edu

Office Hours: Dr Dolezal is available directly after lecture each day or by appointment.

Dr. Lily Arias

Office: 3010 NHB

Email: larias@illinois.edu

Office Hours: By appointment

Lecture TA: Sarah Winnicki - sarahkw2@illinois.edu

Office hours: Thursdays, 1-3PM, 2090 NHB

Contact Sarah for all lecture questions pertaining to content, assignments, and gradebook.

Text: Biological Science, 6th or 7th edition, Scott Freeman, 2013, Pearson Benjamin Cummings, ISBN: 0321976495. This text is OPTIONAL. The course uses the text historically used by IB 150. If you have this text, the readings will be found there and can be useful, but success in the course does not require the text nor are any assignments based on it.

Course Web Site: Materials for the course will be posted on the course Canvas site:

<https://canvas.illinois.edu/>

Course Description: This course covers how animals function in acquiring, processing, and allocating resources in the face of environmental constraints. The inquiry-based laboratory emphasizes testing of hypotheses related to functioning of physiological components of the basic systems of animals.

Learning Objectives:

1. Describe the general function and interrelationships of the respiratory, circulatory, excretory, digestive, nervous, endocrine, reproductive, and immune systems.
2. Relate the principles of homeostasis to the control of organ systems.
3. Demonstrate basic laboratory technique through designing, conducting, analyzing, and interpreting (charts, graphs, tables) physiological experiments.
4. Successfully manage one's time; read and think critically; follow instructions.
5. Assess and synthesize primary scientific literature on physiological systems.
6. Work responsibly, respectfully, and effectively with other students.

Course Grading Philosophy

- 1) We do not 'curve' individual exams or assignments. Instead, we will assign grade cut off points based on the distribution of student point totals at the end of the semester.
- 2) We use the standard 90, 80, 70, 60% scores as starting cutoff points for A, B, C, and D grades, respectively. Depending on the distribution of points at the end of the semester we **may** drop the cut off points slightly (e.g., 88% might become the A cut off) but we **will not raise** the cut-offs.
- 3) Historically the grade distribution in this course has been A: 20-25%, B: 45-50%, C: 20%, D/F: 10%
- 4) Reading assignments for the lectures are provided on the course Moodle site. **Our expectation is that you will read this material before coming to class.** Material from the text will be covered quickly and used as a starting point to explore topics in more detail. **Similarly, all of the laboratory materials will be posted on Canvas. Again, our expectation is that you will read the introductory material in your laboratory manual before coming to the lab each week (see below).**

Exams

All exams will cover lecture material of a given section of the class. Exams can be made up with proper excuse and documentation. Contact Dr. Dolezal or Dr. Arias before the exam or as soon as possible after the exam to ensure that your absence is excused and that a makeup exam can be scheduled. Each of the four exams is worth 75 pts. for a total of 300 points or 30% of your overall grade. There is no final exam for this class.

Online quizzes

For each lecture there will be a post-lecture quiz on Moodle. This quiz will open from the time a lecture ends until the time the next lecture starts. PowerPoints will be posted before each lecture. There will be a total of 30 graded quizzes. Each quiz is worth 10 points for a total of 300 points or 30% of your overall grade. If you complete >30 quizzes, the lowest scores will be dropped.

Writing assignments

There will be two writing assignments which will involve reading and summarizing an original peer-reviewed research article. Each of these is worth 50 points or 5% of your grade. Rubric and assignment are available on Canvas and will be discussed in class when they are assigned.

Lecture attendance policy: This course does not have attendance grade or in-class graded assignments (e.g., clicker questions, etc.). However, students are expected to attend the majority of classes, as the in-class instruction is the primary method for communicating the coursework material. Lectures will not be recorded. For students who do miss lectures, slides will be posted, and material can be made up via those, the readings, working with classmates, and meeting with instructors during office hours. Students who miss a lecture may (and are still expected) take the post-lecture quiz.

Point Allocation

Exams – 300 points - 30% (4 * 7.5% each)

Online quiz assignments – 300 points - 30%

Writing exercises – 100 points - 10% (2 total; each worth 5%)

Lab – 300 points - 30%

Contesting Grades

If you feel that your assignment or exam has been graded inappropriately, you are welcome to contest grades via a written statement within one week of receiving the graded assignment. To contest a grade, you must submit a written statement (preferably via email) of what you believe was graded incorrectly and why the grade should be altered. No oral contesting of grades will be considered, nor will we consider any contest of grades submitted after one week.

Disabilities Statement

If you require special accommodations, please tell Dr. Dolezal or Dr. Arias as soon as possible. All accommodations will follow the procedures as stated in Article 1-110 of the Student Code (http://studentcode.illinois.edu/article1_part1_1-110.html).

Academic Misconduct

Academic integrity is essential to maintaining a learning environment that promotes excellence. We expect that all students will complete all academic and scholarly assignments with fairness and honesty. We adhere to the academic misconduct guidelines outlined by the Student Code of Conduct and will report any suspected academic misconduct. Please see http://studentcode.illinois.edu/article1_part4_1-402.html for additional details. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact Dr. Dolezal or Dr. Arias.

Late Assignment Policy

Assignments must be turned in at the requested date and time to receive full credit. Any assignment submitted up to one day past the requested date and time will be graded with a -20% deduction, and any assignment that is more than one day late will receive no credit. This policy applies to both lecture and lab assignments. Quizzes cannot be made up/done late. Lab assignments can be contested in writing 5 days after being posted on Moodle.

Lab Information

Location: 3002 Natural History Bldg.

Coordinator:

Nick Morphew

Email: morphew2@illinois.edu

Office: 3012 NHB

Phone: 244-7350

Teaching Assistants:

Each lab section will be led by a graduate student

TA; they will provide their own contact

and course information at the first lab

Lab Grade

The lab portion of the course will contribute 30% to your overall course grade. The lab assignments will consist of proposal write-ups, recorded presentations, and in-class discussions. You will perform a total of four lab exercises over the course of the semester: an introductory lab exercise during the first week lab (you will be quizzed over this material), followed by four three-week extended lab exercises. Each of the four three-week lab exercises will follow the same schedule.

In week 1, you will learn important background information and specific skills that will be needed to perform a guided independent experiment of your own design. A group proposal will be assigned this week. **Week 2** will begin with a quiz over the background material, and your group will perform the experiment that you designed in week 1. **In week 3**, you will present the results of your independent experiment as a 15-minute PowerPoint presentation to your lab section. Your lab TA will provide detailed information on our expectations for these write-ups and presentations.

Lab Point Allocation (300 total pts = 30% of total course grade)

Presentations: 4@45 pts. each

Quizzes: 3@20 pts, each and 1 @10 pts.

Experimental Design Write-ups: 4@10 pts. each

Pre-lab question: 1@ 10 pts.

Lab Attendance Policy

Attendance is expected at all scheduled laboratory sessions. Because of limitations on lab space and staffing, missed labs cannot be made up beyond the weeks for which they are scheduled. Absences should be documented in order to be excused. Please notify your TA as soon as possible if you are going to miss a lab, and **please do not attend lab if you are feeling ill**. There will be a 20 pt. penalty applied to the presentation grade for any absence that was not communicated or documented. A penalty can also be applied for lack of participation (10 pts) during a lab unit. Limited accommodation of students with conflicts may be made in other lab sections – **this must be cleared with Nick Morpew at least one week in advance of the anticipated conflict**.

Course Calendar : The calendar is kept up to date through a link on the Canvas page, also found at the link below:

<https://docs.google.com/spreadsheets/d/1sB3pYZCQQ8TC8SZKCqg7watwCo2lSo7YSSeT6VfeWRw/e/dit?pli=1#gid=0>

Tentative calendar:

Week	Day	Date	Lecture #	Module	Topic	Lecturer	6th edition textbook reading	7th edition textbook reading
1	W	1/17/2024	1	Key concepts, course intro	Introduction to course; what is physiology?; Review of Cellular respiration	Dr. Dolezal	190-192 (9.1, "Cellular Respiration", 200-208)	193-196 (9.1, "Cellular Respiration", 205-212)
1	F	1/19/2024	2		Homeostasis, tradeoffs, and scale	Dr. Dolezal	819-834 (39.1 - 39.5)	840-853 (39.1-39.5)
2	M	1/22/2024	3	Respiration and Circulation	Gas Transfer in Air and Water	Dr. Dolezal	874-884 (42.1-42.3)	896-905 (42.1-42.3)
2	W	1/24/2024	4		Properties of Blood & O ₂ Transport	Dr. Dolezal	884-888 (42.4, "How are oxygen and carbon dioxide transported in blood?")	905-908 (42.4, "How are oxygen and carbon dioxide transported in blood?")
2	F	1/26/2024	5		Moving Blood: Open & Closed Circulation Systems	Dr. Dolezal	888-896 (42.5, "Circulation")	908-918 (42.5, "Circulation")
3	M	1/29/2024	6		Circulatory System II, Heart Function	Dr. Dolezal		
3	W	1/31/2024	7		Oxygen in Extreme Environments	Dr. Dolezal	outside material to be assigned	outside material
3	F	2/2/2024	8	Osmoregulation and excretion	Water Balance & Excretion	Dr. Dolezal	836-842 (40.1-40.3)	858-866 (40.1-40.3)
4	M	2/5/2024	9		Osmoregulatory System Diversity	Dr. Dolezal	843-852 (40.4-40.5)	866-874 (40.4-40.5)
4	W	2/7/2024	10		The Kidney	Dr. Dolezal	843-852 (40.4-40.5)	866-874 (40.4-40.5)
4	F	2/9/2024	11		The Urinary Tract, catch up & review	Dr. Dolezal		outside material
5	M	2/12/2024	Exam 1 (Lecture classroom and 2079 NHB)			Dr. Dolezal		
5	W	2/14/2024	12	Metabolism and Digestion	Digestive System	Dr. Dolezal	855-869 (41.1-41.3)	877-891 (41.1-41.3)
5	F	2/16/2024	13		Digestive System II	Dr. Dolezal	855-869 (41.1-41.3)	877-891 (41.1-41.3)
6	M	2/19/2024	14		Hormonal Regulation of Digestion	Dr. Dolezal	855-871 (41.1-41.4)	877-893 (41.1-41.4)
6	W	2/21/2024	15		Energetics and Metabolism - Food to Energy	Dr. Dolezal		
6	F	2/23/2024	16		Gut Microbiomes	Dr. Dolezal	outside material	outside material
7	M	2/26/2024	17	One-page Synopsis Assignment due	Human metabolic evolution	Dr. Dolezal	outside material	outside material
7	W	2/28/2024	18	Maintenance and exercise	Muscle Function	Dr. Dolezal	942-950 (45.1, How do muscles contract?; 45.2, Muscle Tissues)	964-972 (45.1, How do muscles contract?; 45.2, Muscle Tissues)
7	F	3/1/2024	19		Locomotion	Dr. Dolezal	954-958 (45.4, locomotion)	976-980 (45.4, locomotion)
8	M	3/4/2024	20		Synopsis discussion + Review	Dr. Dolezal		
8	W	3/6/2024	Exam 2 (Midterm) (Lecture classroom and Gregory Hall #100)			Dr. Dolezal		
8	F	3/8/2024	21	Animal Nervous System	Principles of Electrical Signaling	Dr. Arias		921-924
8	M	3/11/2024	SPRING BREAK MARCH 9-17					
	W	3/13/2024						
	F	3/15/2024						
9	M	3/18/2024	22	Animal Nervous System	Action Potential	Dr. Arias		924-929
9	W	3/20/2024	23		The Synopsis	Dr. Arias		930-933
9	F	3/22/2024	24		Vertebrate Nervous System	Dr. Arias		934-941
10	M	3/25/2024	25	Animal Sensory Systems	Introduction, Mechanoreception	Dr. Arias		944-952
10	W	3/27/2024	26		Chemoreception	Dr. Arias		956-959
10	F	3/29/2024	27		Photoreception	Dr. Arias		952-956
11	M	4/1/2024	28		Thermoreception, Nociception, Electrorception, Magnetoreception	Dr. Arias		959-961
11	W	4/3/2024	29	Reproductive system	Sexual vs Asexual Reproduction, Gametogenesis, Fertilization I. Case studies	Dr. Arias		1003-1012
11	F	4/5/2024	30		Fertilization II, Egg Development, Stages of Embryonic Development	Dr. Arias		1014-1021
12	M	4/8/2024	Exam 3 (Lecture classroom and 2079 NHB)			Dr. Arias		
12	W	4/10/2024	31	Endocrine system	Endocrine system. Hypothalamus-pituitary axis	Dr. Arias		983-992
12	F	4/12/2024	32		Role of Hormones. Case studies	Dr. Arias		992-1000
13	M	4/15/2024	33	One-page Synopsis Assignment due	Innate immunity	Dr. Arias		1030-1034
13	W	4/17/2024	34	Immune system	Adaptive Immunity: Recognition. Case study	Dr. Arias		1035-1040
13	F	4/19/2024	35		Adaptive Immunity: Activation. Case studies	Dr. Arias		1040-1043
14	M	4/22/2024	36		Adaptive Immunity: Response & Memory. Case studies	Dr. Arias		1044-1048
14	W	4/24/2024	37		COVID 19-I	Dr. Arias		Outside material
14	F	4/26/2024	38		Review of the Immune System	Dr. Arias		Outside material
15	M	4/29/2024	39		TBD	Dr. Arias		No additional reading
15	W	5/1/2024	Exam 4 (Lecture classroom and 2079 NHB)			Dr. Arias		
		5/2/2024	Reading day					