

IB 202: Physiology

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

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

Lecture Information**Instructors:**

Dr. Adam G. Dolezal

Office: 349 Morrill Hall

Email: adolezal@illinois.edu

Office Hours: 10-10:50 AM Fridays (before March 11) or by appointment

Dr. Mark E. Hauber

Office: 469 Morrill Hall

Email: mhauber@illinois.edu

Office Hours: 12-12:50 AM Fridays (on and after March 27) or by appointment

Lecture TA: Nick Antonson (nda4@illinois.edu), 450 Morrill Hall. Contact for all lecture questions pertaining to content, assignments, and gradebook. Office hours 12-12:50 on Friday or by appointment.

Lecture Schedule: 1:00 – 1:50 PM, MWF, 2079 Natural History Building (NHB)

Text: Biological Science, 6th edition, Scott Freeman, 2013, Pearson Benjamin Cummings, ISBN: 0321976495

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

<https://learn.illinois.edu>

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.

Exams and Grading**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 Moodle. Again, our expectation is that you will read the introductory material in your laboratory manual before coming to the lab each week (see below).**

5) In some lectures, we will ask for student input, participation, or collaboration. Participation is encouraged and critical, as it will help you learn the material and help us gauge understanding. This may involve writing out lists, drawing diagrams, or the use of iClickers. While this will not be for credit, participation will be essential for understanding material.

6) There will be two writing assignments which will involve reading and summarizing an original peer-reviewed research article. Each of these will represent 10% of your grade.

Exams

7) The first three exams covering lecture material will be held during the regularly scheduled lecture period; see the lecture schedule for exam dates. Note that these exams may not be held in the lecture room. The final exam will be held during the finals period. Exams can be made up with proper excuse and documentation. If you are ill, you need a doctor's or McKinley letter – a note from the Emergency Dean does not substitute for a doctor's excuse. You must contact Dr. Dolezal or Dr. Hauber 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.

Point Allocation

Exams - 50% (4 – 12.5% each)

Writing exercises - 20%

Lab - 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. Hauber 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. Hauber.

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.

Lab Information

Location: 3002 Natural History Bldg.

Coordinator:

Nick Morphew

Email: morphew2@illinois.edu

Office: 3012 NHB

Phone: 244-7350

Teaching Assistants:

Daniel Swanson

Alessa Laserna

Loralee Wilson

Andrew Wszalek

Nick Antonson (lecture/merit section only)

Lab Grade

The lab portion of the course will contribute 30% to your overall course grade. The lab assignments will consist of quizzes, proposal write-ups, presentations, and in-class discussions. You will perform a total of five 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 the 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 in week 1. **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 pts. total – 30% of total course grade) :

Presentations: 60% of lab grade (4@40 pts. each.)

Quizzes: 20% (5@20 pts. each)

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

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. There will be a penalty applied to the presentation grade for any missed lab (30 pts) or 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.**

Laboratory Safety

Potentially hazardous reagents and materials are employed in modern biology. As is the case with any tool, these are hazardous only when handled improperly. One way to ensure your personal safety is to read the laboratory instructions carefully before coming to class and to adhere to the following general instructions when you are in the lab.

- Wear closed-toed shoes (NOT sandals) at all times in the laboratory.
- Do NOT store, prepare or consume food or beverages, including coffee, in the laboratory.
- Keep drawers and cabinets closed when you are not accessing materials inside.
- Keep bottles, reagents and equipment away from the edges of counters and benches.
- Clean up any spills immediately.
- Learn the locations of safety and first aid equipment and use them when appropriate.
- Wash your hands before leaving the laboratory.
- Clean your lab bench after exercise, including the floor area if necessary. Discard any hazardous or biological materials according to the instructions provided by the Teaching Assistants.
- The lab book, a notebook and writing implements are the only items that should accompany you in your lab space.

Week	Day of Week	Date 2020	Lecture #	Module (Natural History Bldg 2079)	Topic	Lecturer	6th edition textbook reading	7th edition textbook reading
1	Wednesday	22-Jan	1	Key concepts	Introduction to course; what is physiology?; Review	Dr. Doleza	190-192 (9.1, "Cellular Respiration", 200-208)	193-196 (9.1, "Cellular Respiration", 205-209)
1	Friday	24-Jan	2		Homeostasis, tradeoffs, and scale	Dr. Doleza	819-834 (39.1 - 39.5)	840-853 (39.1 - 39.5)
2	Monday	27-Jan	3	Respiration and Circulation	Gas transfer in air and water	Dr. Doleza	874-884 (42.1-42.3)	896-905 (42.1-42.3)
2	Wednesday	29-Jan	4		Properties of blood and O2 transport	Dr. Doleza	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	Friday	31-Jan	5		Moving blood: open and closed circulation systems	Dr. Doleza	888-896 (42.5, "Circulation")	908-918 (42.5, "Circulation")
3	Monday	3-Feb	6		Circulatory system con't, heart function	Dr. Doleza		
3	Wednesday	5-Feb	7		Oxygen in extreme environments	Dr. Doleza	outside material	outside material
3	Friday	7-Feb	8	Osmoregulation and excretion	Water balance and excretion	Dr. Doleza	836-842 (40.1-40.3)	858-866 (40.1-40.3)
4	Monday	10-Feb	9		Osmoregulatory system diversity	Dr. Doleza	843-852 (40.4-40.5)	866-874 (40.4-40.5)
4	Wednesday	12-Feb	10		The kidney	Dr. Doleza	843-852 (40.4-40.5)	866-874 (40.4-40.5)
4	Friday	14-Feb	11		The urinary tract, catch up and review	Dr. Doleza	outside material	outside material
5	Monday	17-Feb		Exam 1		Dr. Doleza		
5	Wednesday	19-Feb	12	Metabolism and Digestion	Digestive system	Dr. Doleza	855-869 (41.1-41.3)	877-891 (41.1-41.3)
5	Friday	21-Feb	13		Digestive system 2	Dr. Doleza	855-869 (41.1-41.3)	877-891 (41.1-41.3)
6	Monday	24-Feb	14		Hormonal regulation of digestion	Dr. Doleza	855-871 (41.1-41.4)	877-893 (41.1-41.4)
6	Wednesday	26-Feb	15		Energetics and Metabolism - food to energy	Dr. Doleza		
6	Friday	28-Feb	16		Gut microbiomes	Dr. Doleza	outside material	outside material
7	Monday	2-Mar	17	Maintenance and exercise	Muscles	Dr. Doleza	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	Wednesday	4-Mar	18		Muscle contractions and locomotion	Dr. Doleza	954-958 (45.4, locomotion)	976-980 (45.4, locomotion)
7	Friday	6-Mar	19	One-page Synopsis Assignment due	Body temperature regulation	Dr. Doleza	831-934 (39.5, Thermoregulation, a closer look)	853-855 (39.5, Thermoregulation, a closer look)
8	Monday	9-Mar	20		Catch up day, Exam Review	Dr. Doleza		
8	Wednesday	11-Mar		Exam 2 (Midterm)		Dr. Doleza		
8	Friday	13-Mar	21		Neurogenesis in the adult brain	Dr. Hauber	PDF online	
9	Monday	16-Mar		SPRING BREAK				
9	Wednesday	18-Mar		SPRING BREAK				
9	Friday	20-Mar		SPRING BREAK				
10	Monday	23-Mar	22		Synapses and neurotransmitters	Dr. Hauber	899-911 (43.1-3)	921-933 (43.1-3)
10	Wednesday	25-Mar	23		The vertebrate nervous system	Dr. Hauber	912-918 (43.4)	934-942 (43.4)
10	Friday	27-Mar	24		Avian auditory systems	Dr. Hauber	922-928 (44.1-2)	944-951 (44.1-2)
11	Monday	30-Mar	25	One-page Synopsis Assignment due	Photoreception and chemical senses	Dr. Hauber	929-938 (44.3-5)	952-960 (44.3-5)
11	Wednesday	1-Apr	26		Avian visual systems	Dr. Hauber	Goldsmith.pdf	Goldsmith.pdf
11	Friday	3-Apr	27	The endocrine system and hormones	Avian endocrine system	Dr. Hauber	Proceedings B paper	Proceedings B paper
12	Monday	6-Apr	28		Hormone chemistry	Dr. Hauber	966-970 (46.2)	988-992 (46.2)
12	Wednesday	8-Apr	29		Hormones and organizational effects	Dr. Hauber	973-975 (46.3)	992-997 (46.3)
12	Friday	10-Apr	30		Hormones and activational effects	Dr. Hauber	Adkins-Regan PDF	Reading to be assigned
13	Monday	13-Apr		Exam 3		Dr. Hauber		
13	Wednesday	15-Apr	31	Reproduction	Overview of reproductive systems	Dr. Hauber	981-998 (47.1-4)	1003-1020 (47.1-4)
13	Friday	17-Apr	32		Hormonal regulation of reproduction	Dr. Hauber	999-1000 (47.5)	1021-1024 (47.5)
14	Monday	20-Apr	33		Sexually transmitted disease ecology	Dr. Hauber	1002-1005 (47.6)	1025-1027 (47.6)
14	Wednesday	22-Apr	34		Pregnancy and birth	Dr. Hauber	Reading to be assigned	Reading to be assigned
14	Friday	24-Apr	35	Immune system and defenses	Introduction to vertebrate immune systems	Dr. Hauber	Reading to be assigned	Reading to be assigned
15	Monday	27-Apr	36		Innate immunity	Dr. Hauber	1009-1012 (48.1)	1030-1034 (48.1)
15	Wednesday	29-Apr	37		Adaptive immunity 1	Dr. Hauber	1013-1017 (48.2)	1034-1039 (48.2)
15	Friday	1-May	38		Adaptive immunity 2	Dr. Hauber	1018-1024 (48.3-4)	1040-1048 (48.3-4)
16	Monday	4-May	39		Malfunctioning of the immune system	Dr. Hauber	1025-1026 (48.5)	1048-1049 (48.5)
16	Wednesday	6-May	40	Final Exam Online		Dr. Hauber		