

BIOLOGY 14: PHYSIOLOGY

Fall 2021

Instructor:	Hannah ter Hofstede
Instructor Email:	hannah.ter.hofstede@dartmouth.edu
Class Meetings:	Tue and Thu 10:10-12:00 in room LSC 200
X-Hours:	X-hours will be used for group office hours (see below)
Office Hours:	Tuesdays 3:00 – 4:00 pm (location TBD) and Fridays 3:30-4:30 (LSC 200)
Lab Director:	Amanda Socha, PhD; Email: amanda.l.socha@dartmouth.edu
Teaching Assistants:	Ridhi Chandarana; Email: ridhi.chandarana.rajesh.gr@dartmouth.edu Pooja Panwar; Email: pooja.panwar.gr@dartmouth.edu Mia Phillips; Email: mia.e.phillips.gr@dartmouth.edu Miranda Zammarelli; Email: miranda.zammarelli.gr@dartmouth.edu

COURSE DESCRIPTION

This course examines the structure and function of cells, tissues, organs, and organ systems, and how combinations of these generate homeostatic mechanisms and adaptive responses that allow organisms to survive environmental changes. It will cover topics in human, animal, and plant physiology, often using a comparative approach, and will also include select examples of pathophysiology. The systems studied will also be considered on an integrative level, by analyzing how different organisms adapt to a variety of environmental demands and stresses (ion and water balance, temperature regulation, changes in O₂ availability) and move through their environment (locomotion, exercise). Lectures are supplemented by lab sessions that include dissections, experiments, data analysis and discussion of research articles, and serve as an introduction to physiological techniques, animal models, and scientific investigation.

LEARNING OUTCOMES

By the end of this course, students should be able to:

- Demonstrate a fundamental understanding of how the human body works and how we are similar to or different from other animals.
- Apply this knowledge to make logical inferences about pathological conditions or evolutionary adaptations in humans and animals.
- Describe how the scientific method is used to gain physiological knowledge, including the roles of hypotheses, predictions, experimental design, and statistical analyses.
- Critically read and evaluate the primary literature in the field of physiology and discuss this literature with peers and scholars.

LECTURES AND MEETINGS

Lectures will be provided as videos to be watched at home prior to class meetings (except for the first lecture, which will be entirely in person). Lecture videos, Powerpoint slides, worksheets and lab materials will be made available on the course Canvas website. Class meetings will be used to review lecture material, participate in group activities (usually in the form of worksheets) and hold question and answer sessions. Students are required to attend a lab session at a specific time once per week during most weeks of the course. See the class schedule on page 5 at the end of the syllabus for dates.

COURSE MATERIALS / RESOURCES

There is no required textbook for the course. All the materials needed for the course will be provided on the Canvas website. This includes lecture videos, Powerpoint slides of the lectures, worksheets and all lab materials. If you would like a textbook to supplement the lecture material, we recommend *Principles of Animal Physiology* by Christopher D. Moyes and Patricia M. Schulte, Pearson Benjamin Cummings, 3rd edition, 2016. A copy of this textbook is available on reserve in the Baker library.

EVALUATION

Five quizzes worth 15% each will account for 75% of the overall grade. Quizzes will be held on Mondays every two weeks during the term and the final quiz will be held during the final exam period (see class schedule on p. 5). Quizzes will cover material from lectures, class worksheets and labs, focusing on material from the previous 2 weeks of the course. Quizzes will be taken through the Canvas website. You may take the quiz anytime between 8:00 am – 8:00 pm Eastern Time on the day of the quiz, but once you start the quiz, you must complete it 1 hour. You must start the quiz before 7:00 pm Eastern Time to have the full time available for the quiz. Unless students have made alternative arrangements with Prof. ter Hofstede **prior to the start of the quiz**, students who do not take the quiz during the scheduled time will receive a quiz grade of zero. To maintain fairness to all students in the course, accommodations for taking a quiz at a different time will only be made in emergency situations, such as serious illness or family crises.

The lab grade will be determined by quizzes, assignments, discussions and lab reports. Please see the lab syllabus for the breakdown of grades for the lab section. Altogether, the lab activities account for 25% of the final grade.

Any requests to re-evaluate the points assigned to quiz questions, lab assignments or lab reports must be submitted **within one week** of receiving the results of the quiz, assignment or lab report. Requests to change grades will not be accepted more than a week after receiving the grade. A clear written explanation of why the question, assignment or lab report should receive additional points must be provided. Quiz re-evaluation requests can be submitted by email to Prof. ter Hofstede. Lab grade questions should be submitted by email to Dr. Socha.

Grades will be determined by the percentage of the total points possible. Letter grades will be determined from the class distribution of percentages around a median grade of B.

HONOR PRINCIPLE

During this course, it is expected that students will abide by the Dartmouth Academic Honor Principle. Please read and think carefully about the policy posted on the Community Standards and Accountability website: <https://students.dartmouth.edu/community-standards/policy/academic-honor-principle>. The Dartmouth College Student Handbook states "*Fundamental to the principle of independent learning are the requirements of honesty and integrity in the performance of academic assignments, both in the classroom and outside. Dartmouth operates on the principle of academic honor, without proctoring of examinations. Students who submit work which is not their own or who commit other acts of academic dishonesty forfeit the opportunity to continue at Dartmouth.*" Although we encourage you to discuss class material with classmates for learning purposes, anything you submit for grading must be **entirely your own work**. For example, copying text from a website, lecture slides or lecture transcripts to answer assignment, test or quiz questions is plagiarism and is a violation of the honor principle. If you have any questions or concerns regarding the honor principle during the course, please contact Prof. ter Hofstede.

COVID-19 INFORMATION

You are expected to attend class and labs in person unless you have made alternative arrangements due to illness, medical reasons, or the need to isolate due to COVID-19. For the health and safety of our class community, please do not attend class when you are sick, nor when you have been instructed by Student Health Services to stay home.

In accordance with [current College policy](#), all members of the Dartmouth community are required to wear a suitable face covering when indoors, regardless of vaccination status. This includes our classroom and other course-related locations, such as labs and office hours. If you need to take a quick drink during class, please dip your mask briefly for each sip. Eating is never permitted in the classroom. The only exception to the mask requirement is for students with an approved disability-related accommodation (see requirements below). If you do not have a college approved accommodation that has been communicated to teaching staff in advance of the class or lab, and you refuse to comply with masking or other safety protocols, teaching staff are obligated to assure that the Covid health and safety standards are followed, and you will be asked to leave the classroom. You remain subject to course attendance policies, and dismissal from lab will result in an unexcused absence. If you refuse to comply with masking or other safety protocols, and to ensure the health and safety of our community, teaching staff are obligated to report you to the Dean's office for disciplinary action under Dartmouth's [Standards of Conduct](#). Additional COVID-19 protocols may emerge. Pay attention to emails from the senior administrators at the College.

ACCOMMODATIONS

Students requesting disability-related accommodations and services for this course are required to register with Student Accessibility Services (SAS; [Getting Started with SAS webpage](#); student.accessibility.services@dartmouth.edu; 1-603-646-9900) and to request that an accommodation email be sent to me in advance of the need for an accommodation. Then, students should schedule a follow-up meeting with me to determine relevant details such as what role SAS or its [Testing Center](#) may play in accommodation implementation. This process works best for everyone when completed as early in the quarter as possible. If students have questions about whether they are eligible for accommodations or have concerns about the implementation of their accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

STUDENTS' RELIGIOUS OBSERVANCES

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please contact Prof. ter Hofstede before the end of the second week of the term to discuss appropriate accommodations.

WELLNESS AND RESPECT

The academic environment at Dartmouth is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you to support your wellness, including your undergraduate dean (<https://students.dartmouth.edu/undergraduate-deans/>), Counseling and Human Development (<https://students.dartmouth.edu/health-service/counseling/about>) and the Student Wellness Center (<https://students.dartmouth.edu/wellness-center/>).

Dartmouth is dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and employment opportunities that Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community. The Sexual Respect Website (Title IX Office:

<https://sexual-respect.dartmouth.edu>) at Dartmouth provides a wealth of information on your rights regarding sexual respect and resources that are available to all in our community.

Please note that, as a faculty member, Prof. ter Hofstede is obligated to share disclosures regarding sexual misconduct under Title IX with Dartmouth's Title IX Coordinator. Confidential resources are also available, and include licensed medical or counseling professionals (e.g., a licensed psychologist), staff members of organizations recognized as rape crisis centers under state law (such as WISE), and ordained clergy (see <https://sexual-respect.dartmouth.edu/get-help-emergency>). Should you have any questions, please feel free to contact Dartmouth's Title IX Coordinator or the Deputy Title IX Coordinator for the Guarini School. Their contact information can be found on the sexual respect website given above.

LABORATORIES

There are six labs during the term. See the class schedule for the weeks during which labs are held. Labs will be conducted in-person and are scheduled for 4 hours. Students are required to attend their assigned lab during the scheduled time. Switching lab sections will not be allowed once labs are assigned. Please see the lab syllabus, the Canvas website and individual lab instructions for detailed descriptions of each laboratory. If you cannot attend lab because you are required to quarantine or isolate, please contact Dr. Socha to make alternative arrangements.

CLASS SCHEDULE

Week	DATE	TOPIC
1	Tue & Wed	NO LAB
	Tue 9/14	Lecture 1: Course Introduction / Molecules and Cells
	Thu 9/16	Lecture 2: Nervous System 1: Functional Organization
2	Tue & Wed	Lab 1: Neurobiology 1
	Tue 9/21	Lecture 3: Nervous System 2: Cell Structure and Function
	Thu 9/23	Lecture 4: Nervous System 3: Sensory Systems
3	Mon 9/27	QUIZ 1
	Tue & Wed	Lab 2: Neurobiology 2
	Tue 9/28	Lecture 5: Endocrine System
	Thu 9/30	Lecture 6: Muscle
4	Tue & Wed	NO LAB
	Tue 10/5	Lecture 7: Cardiovascular Physiology 1
	Thu 10/7	Lecture 8: Cardiovascular Physiology 2
5	Mon 10/11	QUIZ 2
	Tue & Wed	Lab 3: Cardiovascular Anatomy and Function
	Tue 10/12	Lecture 9: Respiratory Physiology
	Thu 10/14	Lecture 10: Exercise & Locomotion
6	Tue & Wed	Lab 4: Cardiopulmonary Anatomy and Function
	Tue 10/19	Lecture 11: Low O ₂ Environments
	Thu 10/21	Lecture 12: Immune system
7	Mon 10/25	QUIZ 3
	Tue & Wed	NO LAB
	Tue 10/26	Lecture 13: Gastrointestinal (GI) System 1
	Thu 10/28	Lecture 14: Gastrointestinal (GI) System 2
8	Tue & Wed	Lab 5: GI Function
	Tue 11/2	Lecture 15: Ion and Water balance
	Thu 11/4	Lecture 16: Plant physiology
9	Mon 11/8	QUIZ 4
	Tue & Wed	Lab 6: Renal physiology
	Tue 11/9	Lecture 17: Guest Lecture Symposium
	Thu 11/11	Lecture 18: Reproduction
10	Tue & Wed	NO LAB
	Tue 11/16	Lecture 19: Thermoregulation
	Final Exam Slot	QUIZ 5