BI 320 INTRODUCTION TO ORGANISMAL PHYSIOLOGY
SYLLABUS – WINTER 2025

Instructor: Dr. Brad Buckley **Email: bbuckley@pdx.edu**
Class Time via Zoom: Mon/Wed 4pm-5:50pm
Office Hours: By Arrangement via Zoom

Required Text: Hill, Cavanaugh and Anderson, "Animal Physiology" 5th Edition

COURSE OVERVIEW AND OBJECTIVES

Prerequisites. Successful completion of Principles of Biology courses BI 211, 212, and 213 with a C- or above (or similar introductory biology series) are prerequisites for this course. Completion of 1 year of chemistry is also recommended.

Course description. Welcome to Introduction to Organismal Physiology! Physiology is the science of how the physical and chemical functions of molecules, cells, tissues and organs interact in living systems to build an integrated organism. The main scope of this course is to provide a comprehensive overview of how physical and chemical processes shape the ways in which whole organisms function. We will cover fundamental topics in physiology that are applicable to all organisms, including microbes, plants and animals. While the strategies that these widely divergent groups employ to meet the physiological requirements for life on Earth vary significantly, there are unifying principles that govern the basic processes and mechanisms that make life possible.

Course objectives.
Upon successful completion of the course students should be able to demonstrate:

- an understanding of how form is related to physiological function.
- an understanding of how homeostatis and homeostasis are maintained through regulatory mechanisms.
- an understanding of physiological organization from the molecular scale to the whole organism.
- an understanding of the fundamentals of enzyme kinetics and the importance of enzymes in physiological function.
- an understanding of the mechanisms by which molecules are transported throughout the body, used in cell-cell communication, and exchanged with the environment.
- an understanding of energy metabolism and the principles of thermodynamics.
- an understanding of the relationship between pressure, resistance, and flow.

Text. *Animal Physiology, 5th edition* by Hill, Cavanaugh, and Anderson (Sinauer Associates, Inc.) is required. The ISBN is 9780197552438 (hardback) or 9780197553619 (ebook).
You can purchase the e-Book version online at : https://www.vitalsource.com/ OR at https://www.redshelf.com/

Course web page. Lecture PowerPoint presentations will be posted on Canvas prior to class periods. Please note that you will want to attend remote lectures in real-time to take notes in

addition to the Zoom recordings. Zoom recordings of lectures will be posted to Canvas after lecture. To access recordings:

1. Log into the course Canvas page.
2. Click on "Zoom"
3. Click on "Cloud Recordings".
4. Select the relevant recording.

Suggestions for your success. The most critical factor determining your success in *any* course is lecture attendance. Even given the remote format, I strongly encourage you to attend lecture each class period. Please take detailed notes, ask questions in the Zoom "Chat" interface and then review and outline the material presented. Although attendance will not be recorded success in this course is unlikely if you do not attend the lectures in real time and keep up with the accelerated pace of the class.

Please read the textbook. I use our lecture time to emphasize the most important concepts from each chapter. The textbook is your best resource for filling in any gaps in your understanding of the lectures. There will be a special emphasis on critical thinking, problem solving, and the synthesis of new information, all of which may take additional effort and a new approach to studying.

GRADING INFORMATION

Examinations. There will be two midterm exams and a semi-cumulative final exam in this course. Each exam will consist of a total of 60 points and will be multiple choice questions taken through Canvas.

If you absolutely must miss an exam for any University-approved event, documented illness, or family emergency, you must contact me BEFORE missing the exam.

Midterm exams will start at 4pm on the scheduled dates listed below. On exam days, you will log into Canvas and take the exam. The exams are open book and open notes. Please DO NOT communicate with other students during the exams. I'm asking you to adhere to this honor code.

Early exams will not be given under any circumstance, so please plan accordingly.

GRADING SUMMARY

	Midterm Exams	Final Exam	Writing Assignment	Total Points Possible
	60 points each	60 points	20 points	200
Percentage of final grade	60%	30%	10%	100%

The final course letter grade will be determined as follows: 91%-100% = A, 90% = A-, 89% = B+, 80-88%= B, 79% = B-, 70-78% = C, 69%= C-, 60-68% = D, <60% = F. **The instructor reserves the right to adjust this grading scale as the course proceeds and a curve is possible.**

EXPECTATIONS AND OTHER INFORMATION

Classroom policies: I expect that you will attend lecture and be an active participant. I welcome questions from students during class, again, via the Chat function on Zoom. However, please understand that our class time is very limited and I may not be able to answer all questions in class. Out of respect for the learning environment of your fellow classmates, please ensure that your questions are directly relevant to the lecture topics being discussed. If you have questions about physiology that veer away from the topics at hand, please discuss these with me during office hours.

I ask that you respect your fellow classmates during the class period. I'll have your audio muted on Zoom as you join the lecture but you can unmute yourself to ask questions.

Please remember that university course materials, including lectures and PowerPoint files, are the result of a professor's scholarly activities, in much the same way that our research and publications are. While I do allow audio recording of lectures for personal use, you hereby agree not to post these recordings on any internet source or website (aside from Canvas where lectures will be automatically posted).

Academic misconduct. Cheating, including plagiarism, is unacceptable and will absolutely not be tolerated. I expect the work you turn in to be your own, and that information from others is referenced and cited appropriately. I expect you to have academic integrity and abide by the University Code of Student Responsibility. **ALL suspected cases of academic misconduct will be reported to the Office of Academic Affairs and included in your permanent academic record.** Repeated offenses or an offense involving an assignment comprising the greater part of the total grade (i.e. exams) will result in a failing grade for the course.

Access and Inclusion for Students with Disabilities

PSU values diversity and inclusion; we are committed to fostering mutual respect and full participation for all students. My goal is to create a learning environment that is equitable, useable, inclusive, and welcoming. If any aspects of instruction or course design result in barriers to your inclusion or learning, please notify me. The Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment.

Title IX Reporting Obligations and Creating a Safe Learning Environment

As an instructor, one of my responsibilities is to help create a safe learning environment for my students and for the campus as a whole. We expect a culture of professionalism and mutual respect in our department and class. You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to either the Office of Equity and Compliance or the Office of the Dean of Student Life.

Please be aware that as a faculty member, I have the responsibility to report any instances of sexual harassment, sexual and or/physical violence and/or other forms of prohibited discrimination. If you would rather share information about harassment or violence to a confidential employee who does not have this reporting responsibility, you can find a list of those individuals. For more information about Title IX please complete the required student module Creating a Safe Campus in your Canvas.

Providing Academic and Employment Support to Students: Title IX of the Educational Act of 1972 (http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf) requires educational institutions such as PSU to provide academic and employment support to students and/or employees, including student employees, who experience sexual harassment, sexual assault or any other form of interpersonal violence. PSU is committed to providing students with an educational environment where students may thrive in their educational pursuits. Incidents of interpersonal violence or sexual harassment may create barriers to students completing their education. We at Portland State support students to help them overcome these barriers. PSU's Dean of Student Life, Title IX Coordinator, Interpersonal Violence (IPV) Advocates and CARE team are committed to assisting students who have experienced any form of sexual harassment or interpersonal violence. Information about student resources, including confidential services, can be found here: https://www.pdx.edu/sexual-assault/sites/www.pdx.edu.sexual-assault/files/SA-IPVResourceHandout.pdf.

COURSE OUTLINE AND EXAM DATES*

WEEK	DATE	TOPIC	CHAPTERS
1	**Jan. 6 - 8**	**Course Introduction** Homeostasis, Cell Membranes, Enzymes	**1,2**
2	**Jan. 13-** **Jan. 15**	Homeostasis, Cell Membranes, Enzymes cont'd; Genomics and Epigenetics	**3,4**
3	**Jan. 20** **Jan. 22**	**HOLIDAY NO CLASS** Genomics and Epigenetics cont'd	**4**
4	**Jan. 27** **Jan. 29**	**MIDTERM 1 Attendance Required** Osmosis and Diffusion, Osmoregulation	**5,27**
5	**Feb. 3-5**	Energy Mechanics and Thermodynamics, Aerobic and Anaerobic Metabolism	**7,8**
6	**Feb. 10-12**	Thermal Biology, Membrane Potentials and Chemical Signaling	**10, 12, 13**
7	**Feb. 17** **Feb. 19**	Thermal Biology Continued **MIDTERM 2 Attendance Required**	**12, 13**
8	**Feb. 24-26**	Chemical Transport and Endocrine Signaling	**2,16**
9	**Mar. 3-5**	Endocrine Continued; Pressure, Resistance and Flow	**16, 25**
10	**Mar. 10-12**	Pressure, Resistance and Flow	**25**
	Mar. 17	**FINAL EXAM - Mon. 3:30pm – 5:20pm** **Attendance Required**	

** Exam dates are fixed and you must be present on Canvas to take them. Lecture topics will be presented in the order in the table above. **However, some topics may be continued on subsequent days.**