

SYLLABUS

BIOL 543: Comparative Physiology, Fall 2024

GENERAL INFORMATION

Schedule: Tuesday and Thursday; 4:25 PM – 5:40 PM

Location: Jones PSC 120

Instructor: Dr. Daniel I. Speiser

Office and Lab: CLS 606

Phone #: 803-777-6597

Email: speiser@mailbox.sc.edu

Website: See Blackboard for course documents and announcements.

Office Hours and Communication: I will hold virtual office hours in my lab (CLS 606) on Friday afternoons from 1:30-2:30pm. If you would like to talk with me outside of class or office hours, please contact me by email. We can then arrange a time to talk in-person or remotely by email, phone, or video. If you send me an email between 9am and 5pm, I will do my best to respond the same day. Please do not expect immediate responses to emails sent after normal work hours or on weekends (i.e. later than 5pm).

Required Text: *Animal Physiology, Fourth Edition* (2016) Richard W. Hill, Gordon A. Wyse and Margaret Anderson (Sinauer; ISBN: 978-1-60535-471-2).

Other Required Resources: A scientific calculator capable of calculating logs, exponents, and roots. Primary literature will be made available to students by the instructor via Blackboard.

Graduate Students: BIOL 543 a 500-level class, so it is available to graduate students as graduate credit. Graduate students will write a mock grant proposal describing an experiment relevant to the field of comparative physiology on a topic of their choice.

Students with diagnosed learning disabilities: I am committed to ensuring course accessibility for all students. Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the [Student Disability Resource Center](#): 777-6142, TDD 777-6744, email sadrc@mailbox.sc.edu, or stop by Close-Hipp Suite 102. All accommodations must be approved through the Student Disability Resource Center.

COURSE DESCRIPTION

Comparative Physiology (BIOL 543), taught by Associate Professor Dan Speiser, uses an integrative and comparative approach to understand how animals function. In particular, the course focuses on the fundamental questions that life asks of all animals and the different ways that animals answer these questions. In some cases, different animals solve similar problems in similar ways; in other cases, different animals solve similar problems in dissimilar ways. We have much to learn from both scenarios.

The course embraces August Krogh's belief that "For a large number of problems there will be some animal of choice or a few such animals in which it can be most conveniently studied." A comparative understanding of diverse animals (*e.g.* cnidarians, annelids, molluscs, arthropods, and vertebrates) is thus viewed as advantageous, with different types of animals emerging as model systems for illustrating the general principles that underlie how animals answer the fundamental questions of life.

Comparative Physiology will establish a foundational knowledge for students continuing in a variety of careers, ranging from biological research to engineering to medicine. I hope the course helps students appreciate the importance of biodiversity, both for its own sake and for our own. The topics in physiology we will cover include Feeding and Digestion, Metabolism, Thermoregulation, Respiration, Circulation, Osmoregulation, Endocrine Systems, Nervous Systems, Muscle, and Locomotion.

LEARNING OUTCOMES

The goal of Comparative Physiology (BIOL 543) is for students to explore, expand, and assess their knowledge of the biological principles that underlie how animals – including humans – function, and to do so in an integrative and comparative manner.

Upon successful completion of BIOL 543, undergraduate students should be able to:

1. **Compare, contrast**, and otherwise **evaluate** the different physiological systems that animals have evolved to address the major physiological questions posed by life on our planet;
2. **Describe** the structural principles and molecular mechanisms that underlie these different physiological solutions to life's big questions;
3. **Interpret** graphs, charts, and tables relevant to comparative physiology;
4. **Apply** the fundamental mathematical models of physiology in an appropriate manner.

In addition to the Learning Outcomes listed above, graduate students should be able to:

Apply the skills and knowledge gained in lecture to a mock grant proposal describing an experiment relevant to the field of comparative physiology on a topic of their choice.

COURSE EXPECTATIONS

Fundamentals: Comparative Physiology builds on a foundation of general biology, mathematics, and your prior experience with the natural world. Please reach out in the first or second week of class if you are concerned about the adequacy of your preparation for the course.

Schedule: A *tentative* timeline for the course is posted on Blackboard. The dates of the lectures and assignments will not change. However, topics for each day may change. Any changes or clarifications will be announced in class and on Blackboard.

Textbook: I expect that you will acquire a copy of the textbook assigned for the course (see above). Please review chapters from the book *prior* to the lectures with which they are associated. Attend class prepared: reading the assignments in advance will help you follow the lectures.

Primary literature: I will assign primary literature associated with some of the topics we cover in the course. I expect you to read these papers before the class period during which we will discuss them.

Attendance: BIOL 543 will be an in-person course. I expect all students to attend in-person lectures. There will be no penalty for excused absences. Please consult USC's [Undergraduate Academic Regulations](#) to see what counts as an excused absence. Because we will be reviewing assignments in class, I will not accept late assignments. If you miss class for some reason, I expect you to review the day's material. I consider unexcused absences above 10% of the course total (3 classes) to be unacceptable and reserve the right to enact a grade penalty for such excessive absences.

Online materials: Following each day of class, I will post lecture slides on Blackboard. I will also post papers for the course. I will not live-stream lectures or post recordings of lectures. The reason for this is that BIOL 543 is listed as an "in-person" course and not a "virtual" or "hybrid" course and I am required to abide by the course designation.

Assignments: There will be 23 quizzes and 3 exams associated with this course. The quizzes and exams will be mixes of multiple choice and short answer questions. All quizzes will be given in-class. I will pass them out at the beginning of a class period and collect them at the end of the same class period. I will drop your three lowest quiz scores from your final grade. The exams will take place in class and will be limited in time to the class period (with extra time available if I have documentation from the SDRC). You will not use books, papers, or your notes during the exams. I expect you to answer questions using material we cover in BIOL 543.

Participation: Please ask questions during lecture!

Extra Credit: There will be no opportunities for extra credit.

GRADING

Your grade for Comparative Physiology will be based on the following:

Quizzes	120 points	23 quizzes, 6 pts each, three lowest scores dropped
<u>Exams</u>	<u>180 points</u>	<u>3 exams, 60 pts each</u>
Total	300 points	

As an additional assignment graduate students will write a mock grant proposal describing an experiment relevant to the field of comparative physiology on a topic of their choice (50 points).

Grades are based on the accumulation of points. The number of points necessary to earn each letter grade is as follows:

Undergraduate Grading Scale (out of 300 points total)

A	≥ 270.0	C	210 – 224
B+	255 – 269	D+	195 – 209
B	240 – 254	D	180 – 194
C+	225 – 239	F	< 180

Graduate Grading Scale (out of 350 points total)

A	≥ 315.0	C	245 – 261
B+	297 – 314	D+	227 – 244
B	280 – 296	D	210 – 226
C+	262 – 279	F	< 210

The grades for assignments will not be curved. However, a uniform post-hoc adjustment may or may not be applied for each assignment to account for its difficulty. These adjustments will not result in anyone receiving a lower grade than they would have received otherwise. If you request a re-grade, please note that your score may be adjusted upwards or downwards upon review.

Exam 1 will be held in-class on Thursday, 19 September during the normal class time in PSC 120.

Exam 2 will be held in-class on Thursday, 24 October during the normal class time in PSC 120.

Exam 3 will be held on Tuesday, 10 December at 4:00pm in PSC 120.

CLASSROOM POLICIES

- **Please show consideration for your classmates and instructor.** You will do so by:
 - Silencing your mobile devices before class starts.
 - Not engaging in distracting behaviors during class.
 - Asking questions relevant to the material being covered in class.
 - Using proper grammar, spelling, punctuation, and capitalization when sending course-related e-mails. Text message language is not acceptable.

- **Every student has a role in maintaining the academic reputation of the University.** It is imperative that you refrain from engaging in plagiarism, cheating, falsifying your work and/or assisting other students in violating the Honor Code. Important components of the Honor Code:
 - Faculty members are required to report potential violations of the Honor Code to the Office of Student Conduct and Academic Integrity.
 - Lying and falsifying documents are violations of the Honor Code.
 - When a student is uncertain as to whether conduct would violate the Honor Code, it is the responsibility of the student to seek clarification from the appropriate faculty member.

- **Any deviation from the University of South Carolina Honor Code will result in a minimum of a zero score on the relevant assignment.** As determined by the Office of Academic Integrity, more severe disciplinary measures may be taken as well.

- **The use of previous semester course materials is not allowed in this course.** This applies to homework, projects, quizzes and tests. Because these aids are not available to all students within the course, their use by any individual student undermines the fundamental principles of fairness and disrupts your professor's ability to accurately evaluate your work. Any potential violations will be forwarded to the Office of Student Conduct and Academic Integrity for review.

- **Course materials may not be redistributed to others in any manner.** Lectures and course materials (which is inclusive of my presentations, tests, exams, outlines, and lecture notes) maybe protected by copyright. You are encouraged to take notes and utilize course materials for your own educational purpose. However, you are not to reproduce or distribute this content without my expressed written permission. This includes sharing course materials to online social study sites like CourseHero and other services. Students who publicly reproduce, distribute or modify course content maybe in violation of the university's Honor Code's Complicity policy.

STATEMENTS

Values: Two core values, inquiry and civility, govern our class. Inquiry demands that we all cultivate an open forum for exchange and substantiation of ideas. Strive to be creative, to take risks, and to challenge our conventional wisdom when you see the opportunity. Civility supports our inquiry by demanding ultimate respect for the voice, rights, and safety of others.

Access and Opportunity: The University is committed to a campus environment that is inclusive, safe, and respectful for all persons, and one that fully embraces the Carolinian Creed. To that end, all course activities will be conducted in an atmosphere of friendly participation and interaction among colleagues, recognizing and appreciating the unique experiences, background, and point of view each student brings. You are expected at all times to apply the highest academic standards to this course and to treat others with dignity and respect. The decision to enter university and pursue advanced study is a choice that entails commitment to personal ethics expressed in the Carolinian Creed: “I will discourage bigotry, while striving to learn from differences in people, ideas and opinions.”

Title IX and Gendered Pronouns: This course affirms equality and respect for all gendered identities and expressions. Please inform me of your preferred gender pronoun and/or name if it is different from what is indicated on the official class roster. Likewise, I am committed to nurturing an environment free from discrimination and harassment. Consistent with Title IX policy, I must report all incidents of interpersonal violence and sexual misconduct, and thus cannot guarantee confidentiality. Please know that you can seek [Confidential Victim Advocacy and Support](#). If you want to make a formal report, you can [Submit an Interpersonal Violence Incident Report](#) or contact the institution’s Title IX Coordinator, or one of the Deputy Title IX Coordinators listed on the Stop Sexual Assault website. You can also file a police report by contacting USC Police at 803-777-4215.

Office of Student Advocacy: If facing illness, family emergencies, or other events requiring prolonged absence from class, please reach out to the [Office of Student Advocacy](#).

Expectations of the Instructor: I am expected to facilitate learning, to answer questions appropriately, to be fair and objective in grading, to provide timely and useful feedback on assignments, to maintain adequate office hours, and to treat students as I would like to be treated in their place.

Copyright/Fair Use Statement: I will cite and/or reference any materials that I use in this course that I do not create. You, as students, are expected to not distribute any of these materials, resources, quizzes, tests, homework assignments, and so on (whether graded or ungraded).