

Animal Physiology Biology 401 Spring 2022

Instructor: Dr. Douglas Currie

LECTURE TIMES: TUES + THUR 12:30-1:45
LECTURE LOCATION: 533 Science Building

Office: 231 B Wing of the Science Building,
Portland Campus.
Phone: 228-8192

Lab: 194 New Wing of the science building, Portland Campus.
Phone: 228-8384

Email: douglas.currie@maine.edu

Webpage: <http://www.usm.maine.edu/bio/douglas-currie>



I am a biologist and neuroscientist and I have always been fascinated by biological systems, how something as complex as an organism is built and functions. The goal of this course is for you to learn the details of the cellular and molecular processes that underlie some of the major physiological systems in animals. Understanding will link function at multiple levels (molecular, cellular, organ, organism, environment). We will also utilize the scientific literature to develop an appreciation for what scientists researching physiological processes do and how they do it.

Campus map:

<http://usm.maine.edu/sites/default/files/about/portland-campus-map.pdf>

Office Hours: Tuesday and Thursday 1:45-2:15 or by appointment. At these times I could be in my office or in my lab- talk to me after lecture to check. I will also be available to respond to email questions which you can send to me at the address above. Talk to me or email to make an appointment.

Mon.	Tues.	Wed.	Thurs.	Fri.
	Lecture: 12:30- 1:45	Lab prep	Lecture: 12:30- 1:45	Faculty meeting
Bio 106 lab prep	Office hours 1:45-2:15	Lab prep	Office hours 1:45-2:15	Administrative meetings
Bio 106 Lab	Lab setup	Bio 402 Lab 1:00-5:00	Research	Research

Prerequisites: You must have successfully completed CHY 115, either PHY 111 or PHY 121, AND (i.e. grade C- or higher) Bio 107 or Bio 109, Bio 211, or have permission of the instructor.

Text: Animal Physiology: Hill, Wyse and Anderson. 4th Edition

Additional resources: Powerpoint presentations for each chapter will be available on the blackboard site for this course. I will also post the review and research papers we will be using and homework assignments on the blackboard site: <https://www.courses.maine.edu>

Additional reading material – during classes and for homework I will discuss other material to enhance information on some areas not covered in enough detail in the textbook. This material will be available on the Blackboard website and will be included in the exams. Because the course will also require written assignments, I also recommend “A Short Guide to Writing about Biology”, 5th Ed., by Jan Pechenik or “A Student Handbook for Writing in Biology”, 3rd Ed., by Karin Knisely.

Attendance: I expect students to attend all lectures. The material in the textbook is relatively complex and I will also cover material not in the textbook and so you will miss explanations and information if you do not attend class.

Reading: I expect students to read the appropriate chapter in the textbook prior to each lecture. We will cover a fair amount of material in this course and you will find it easier if you take the time to both prepare beforehand and review afterwards while the material is still fresh in your mind. I therefore strongly encourage students to keep up with the material and review your notes, the textbook, the additional material I have assigned and the powerpoints for the lectures on a regular basis. I also strongly encourage students to form study groups to review material. Ask questions if you do not understand something- chances are that you are not the only one who would benefit from having it explained. The more you work with the material the easier it will be to understand and recall.

Become a better learner: The university has established a new program “AGILE” (Academic Gains through Improved Learning Effectiveness) which I encourage you to make use of. It addresses some of the major ways that you can improve how you study and learn material in order to help you become more efficient and effective learners. You can visit the site at: <https://usm.maine.edu/agile>

Grading: Your final grade will be determined by in class assignments, homework, a major research paper and a final exam. The major elements of the homework will be written summaries and critiques of scientific papers, you will also submit discussion questions for each paper we cover. Your research paper will be on a specific physiological trait which you will investigate yourself during the semester. The breakdown of the contribution of these to your grade will be:

Essay reports on papers:	40%
In class presentations and discussion questions:	25%
Research paper:	25%
Final exam:	10%

Homework should be submitted in hard copy and digitally, in either Microsoft Word or PDF format. My laptop is a PC and so I cannot read Mac Pages format with it. Homework will not be accepted more than one week after the deadline for the assignment. For some homework assignments you will have the option to submit a powerpoint presentation or audio presentation in place of a written piece.

The letter grades for the class will be awarded using the following scale:

A= Excellent 90-100%

B= Above average 80-89%

C= Satisfactory 70-79%

D= Unsatisfactory 60-69%

F= Failing, below 60%

Plus and minus grades will also be given. Attendance, participation and effort will also be considered with borderline grades.

ACADEMIC INTEGRITY

Everyone associated with the University of Southern Maine is expected to adhere to the principles of academic integrity central to the academic function of the University. Any breach of academic integrity represents a serious offense. Each student has a responsibility to know the standards of conduct and expectations of academic integrity that apply to academic tasks. Violations of academic integrity include any actions that attempt to promote or enhance the academic standing of any student by dishonest means. Cheating on an examination, stealing the words or ideas of another (i.e., plagiarism), making statements known to be false or misleading, falsifying the results of one's research, improperly using library materials or computer files, or altering or forging academic records are examples of violations of this policy which are contrary to the academic purposes for which the University exists. Acts that violate academic integrity disrupt the educational process and are not acceptable.

Evidence of a violation of the academic integrity policy will normally result in disciplinary action. A copy of the complete policy may be obtained from the office of Community Standards and Mediation, online at usm.maine.edu/community-standards-mediation/academic-integrity or by calling and requesting a copy at (207) 780-5242.

Students with disabilities: The University has a very good Disabilities Service Center located at 242 Luther Bonney Hall. Students with any form of disability are encouraged to contact that office which offers multiple forms of assistance and can arrange course accommodations. Students with disabilities must bring a letter from the Disabilities Service Center to me at the beginning of the semester so that they can be given appropriate accommodations.

DSC Office. Rm 242 Luther Bonney, Voice Phone 780-4706, email: dsc@usm.maine.edu web site: <http://usm.maine.edu/dsc>

Goals: By the completion of the course students will have an understanding of the processes underlying the function of multiple physiological systems and the way in which these properties regulate system function. Students will develop an appreciation for the role of selective pressures in driving the evolution of specialized physiological characteristics and for the interconnected nature of physiological processes. You will also have a better sense of how scientists conduct their research to make discoveries and how discoveries in different organisms can benefit the medical field.

COVID: With the upsurge in of the omicron variant there are a number of requirements for all participants in the class.

1. Approved face coverings over mouth, nose, and chin are required inside all university buildings regardless of vaccination status, as per University requirements.
2. Facemasks must be worn so that they cover **BOTH** nose and mouth.

3. Students and instructors will **NOT** come to class if they feel unwell. If you feel unwell it is your responsibility to contact Dr. Currie (douglas.currie@maine.edu) to let me know and we will work to arrange for you to cover the missed content and keep up with the assignments.
4. The university requires those who are not vaccinated to be tested weekly for COVID and individuals must quarantine per university and CDC guidelines if they are identified as a close contact of someone who has or has tested positive for COVID.

Course Evaluations:

At the end of each semester every student has the opportunity to provide constructive feedback on the course. It is important to me that you take the time to let me know your thoughts about the course. I use your feedback to make improvements in the course materials, assignments, and outcomes.

Tutoring and writing assistance:

Tutoring at USM is for *all* students, not just those who are struggling. Tutoring provides active feedback and practice, and is available for writing, math, and many more subjects. Walk-in tutoring is available at the Glickman Library in Portland, the Gorham Library, and the LAC Writing Center. For best service, we recommend making an appointment at <https://usm.maine.edu/learningcommons/schedule-tutoring-appointment>. Questions about tutoring should be directed to Naamah Jarnot at 207-780-4554

University Health and Counseling Services is a student resource that promotes the health and well-being of the USM community. More information can be found at www.usm.maine.edu/uahcs.

At any point in the semester, if you encounter difficulty with the course or feel that you could be performing at a higher level, don't hesitate to consult with me right away. For counseling, the best way to schedule an appointment is by phone at 780-5411.

Nondiscrimination policy:

The University of Southern Maine is an EEO/AA employer, and does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender expression, national origin, citizenship status, age, disability, genetic information or veteran's status in employment, education, and all other programs and activities. The following person has been designated to handle inquiries regarding non-discrimination policies: Amie Parker, Interim Director of Equal Opportunity, The Farmhouse, University of Maine Augusta, Augusta, ME 04333, 207.581.1226, TTY 711 (Maine Relay System).

TITLE IX STATEMENT

The University of Southern Maine is committed to making our campuses safer places for students. Because of this commitment, and our federal obligations, faculty and other employees are considered mandated reporters when it comes to experiences of interpersonal violence (sexual assault, sexual harassment, dating or domestic violence, and stalking). Disclosures of interpersonal violence must be passed along to the University's Deputy Title IX Coordinator who can help provide support and academic remedies for students who have been impacted. More information can be found online at <http://usm.maine.edu/campus-safety-project> or by contacting Sarah E. Holmes at sarah.e.holmes1@maine.edu or 207-780-5767.

If students want to speak with someone confidentially, the following resources are available on and off campus: University Counseling Services (207-780-4050); 24 Hour Sexual Assault Hotline (1-800-871-7741); 24 Hour Domestic Violence Hotline (1-866-834-4357).

Actual Syllabus Bio 401 Physiology Spring 2020

This is a tentative schedule and may be adjusted by the instructor if necessary

Jan 18	Introduction, Animals and environments Chapter 1
Jan 20	Introduction, Animals and environments Chapter 1
Jan 25	Introduction, Animals and environments Changing physiology
Jan 27	Introduction, Animals and environments Changing physiology
Feb 1	Genomics + Proteomics Chapt 3
Feb 3	Genomics + Proteomics Chapt 3
Feb 8	Genomics + Proteomics Icefish physiology
Feb 10	Genomics + Proteomics Icefish physiology
Feb 15	Transport of solutes and water Chapt 5
Feb 17	Transport of solutes and water Chapt 5
Feb 22	Transport of solutes and water Osmotic control
Feb 24	Transport of solutes and water Aquaporins
Mar 1	Thermal relations Chapt 10
Mar 3	Thermal relations Chapt 10
Mar 8	Thermal relations Brown fat
Mar 10	Thermal relations Life in Frigid places
Mar 15	Spring Break
Mar 17	Spring Break
Mar 22	Sensory Processes Chapt 14
Mar 24	Sensory Processes Chapt 14
Mar 29	Sensory Processes Star nosed mole
Mar 31	Sensory Processes
Apr 5	External respiration CO ₂ and O ₂ transport Chapt 23+24
Apr 7	External respiration CO ₂ and O ₂ transport Chapt 23+24
Apr 12	External respiration CO ₂ and O ₂ High Altitude adaptations
Apr 14	External respiration CO ₂ and O ₂ Diving animals
Apr 19	Muscle use and disuse Chapt 20+21
Apr 21	Muscle use and disuse Chapt 20+21
Apr 26	Muscle use and disuse Physiology of aging
Apr 28	Muscle use and disuse Sarcopenia
May 2	<u>Finals Week</u>