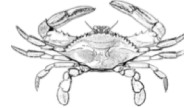
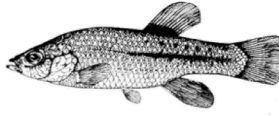


PHYSIOLOGY AND CELL BIOLOGY OF MARINE ORGANISMS Syllabus - Spring 2019



Course: BIOL 600-01 and EVSS 620-01

Instructor: Jody Beers

Lecture: MW 9:00 am - 10:30 am in Grice 202

Lab: T 9:00 am - 12:00 pm, TH 9:00 am - 12:00 pm in Grice 113

Office Hours: MW 10:30 am to 12:00 pm and by appointment

Office: Hollings Marine Lab H112-H

Email: beersjm@cofc.edu

Course Description: A study of the regulatory mechanisms found in marine organisms, especially as these relate to interactions between the organism and the environment. Mechanisms will be discussed at the organismal, organ-system, tissue, and cellular levels. Lectures three hours per week; laboratory three hours per week.

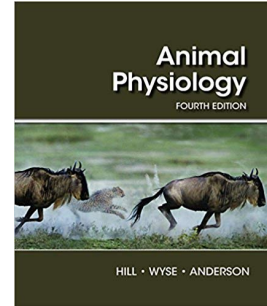
Course Goals: This core course is designed to acquaint the graduate student with the principles governing form and function in marine organisms. This course builds on the background all students have in the areas of cell biology and organismal physiology, and integrates this information with other disciplines of marine biology. The laboratory will provide students with skills and approaches necessary to understand, to address, and to solve larger problems in marine biology.

Specific learning outcomes:

1. Students will be able to recognize specific physiological terms and put them into the context of the functioning of cells, tissues, organs, and organisms.
2. Students will be able to solve quantitative problems associated with different physiological systems and relate the solutions to the different environmental or organ-system situations posed.
3. Students will be able to write a scientific paper in a clear and organized manner in formats used in the primary scientific literature.
4. Student will be able to orally present a topic to an audience on a physiological subject in a clear and understandable manner.
5. Students will be able to perform chemical assays, perform dilutions, and analyze raw data in the laboratory in the context of simple experimental questions.
6. Students will be able to analyze a particular situation and suggest ways a cell, a tissue, an organ, or an organism might respond.

Course Materials:

There is no required textbook for this course. I will supply background readings from the primary literature and other supplemental sources. All material will be made available either on OAKS, via e-mail exchange, or in hard copy format in class. If you would like your own text for reference, I recommend Hill’s *Animal Physiology* as one possible source. You will need a lab notebook; this should be a hardbound type (e.g. composition notebook).



Grading policy:

There will be three lecture exams and a cumulative final examination. The lecture portion of the course will count for 75% of the final grade and the laboratory 25%. Approximately one half of the final exam will count as the fourth lecture exam and the remainder will cover the entire course. Since the final exam covers material representing the breadth of the course, an excellent performance on the final can boost a student’s grade higher than the raw score would dictate. On the other hand, an excessively poor performance on the final exam could cause a student’s final grade to be lower than the raw score would dictate.

Grade Assessment		Percent
Lecture	9% lowest lecture exam grade 14% middle lecture exam grade 20% highest lecture exam grade 22% final exam (cumulative)	65
Class Presentation	Includes performance as primary presenter and discussion leader	10
Laboratory	Lab Performance – 5% Reports – 20%	25
		100

The grading scale will be approximately as follows:

- A = 91 – 100%
- B+ = 86 – 90%
- B = 81 – 85%
- C+ = 76 – 80%
- C = 65 – 75%
- F = 0 – 64%

Make-up exams and class attendance:

Students are required to attend each laboratory session and are expected to be in class each day and on time. Students who miss a laboratory or an examination for a valid and documented reason must report to me as soon as possible. All medical or family emergencies must be documented in writing. Make-up exams must be taken as soon as possible and will be scheduled at my discretion. Students who do not comply with this policy will receive a grade of zero percent on the missed exam.

Policy on viewing previous exams:

- I allow students to view their exams when I hand them back and to learn from their mistakes. Any student may view his or her exam at any time, but this will be under supervised situations.
- Exams may not be copied under any circumstances.
- A student may take personal notes on specific questions, but these notes may not be shared with other students at any time. To do so is a violation of the College of Charleston honor code.
- A student may not view exams that may have been improperly copied by graduate students in previous years. To do so is a violation of the College of Charleston honor code.

College of Charleston Honor Code and Academic Integrity:

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when suspected, are investigated. Each incident will be examined to determine the degree of deception involved. Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file. Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This status indicator will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. Students should be aware that unauthorized collaboration--working together without permission--is a form of cheating. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor. Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

Students with Disabilities:

If there is a student in this class who has a documented disability and has been approved to receive accommodations through SNAP Services, please feel free to come and discuss this with me at any time.

Tentative Class Schedule:		
Week	Date	Topic
1	January 9	Introduction; Overview of the use of marine organisms for scientific discovery.
2	January 14	Driving forces for mechanisms at the molecular, cellular, tissue, and organismal levels.
2	January 16	Water and Solutes. Mechanisms of membrane permeation.
3	January 21	NO CLASS – Martin Luther King Day
3	January 23	Equilibrium potentials; Membrane potentials; Nerves and muscles.
4	January 28	Equilibrium potentials; Membrane potentials; Nerves and

		muscles.
4	January 30	Communication Across, Between and Within Cells: Nerves and muscles.
5	February 4	Communication Across, Between and Within Cells: Nerves and muscles.
5	February 6	Communication Across, Between and Within Cells: Cell Signaling.
6	February 11	FIRST LECTURE EXAM
6	February 13	Communication Across, Between and Within Cells: Molecular Mechanisms & Techniques in Molecular Biology.
7	February 18	Communication Across, Between and Within Cells: Molecular Mechanisms & Techniques in Molecular Biology.
7	February 20	Interactions with the Environment: Properties of solutes and characteristics of water inside cells. - Volume regulation.
8	February 25	Interactions with the Environment: Water and salt balance.
8	February 27	Interactions with the Environment: Water and salt balance.
9	March 4	Interactions with the Environment: Water and salt balance - chloride cells and fishes.
9	March 6	SECOND LECTURE EXAM
10	March 11	Interactions with the Environment: Water and salt balance – kidneys. CLASS PRESENTATIONS BEGIN
10	March 13	Interactions with the Environment: Respiration and Circulation. Hypoxia, activity, and air exposure.
	March 18 - 20	NO CLASS – Spring Break
11	March 25	Interactions with the Environment: Respiration and Circulation. Hemodynamics.
11	March 27	Interactions with the Environment: Respiration and Circulation. Hemodynamics.
12	April 1	Interactions with the Environment: Respiration and Circulation. Hemodynamics.
12	April 3	Interactions with the Environment: Acid-base balance. Hypercapnia, activity, and air exposure.
13	April 8	Interactions with the Environment: Acid-base balance. Hypercapnia, activity, and air exposure.
13	April 10	THIRD LECTURE EXAM
14	April 15	Interactions with the Environment: Ocean Acidification
14	April 17	Interactions with the Environment: Ocean Acidification
15	April 22	Interactions with the Environment: Ocean Acidification
15	April 23	Help Session
15	April 24	FINAL EXAM
*** Schedule and topics subject to modification ***		

Laboratory Safety:

Laboratory safety is a serious issue. A comprehensive chemical hygiene plan for the College of Charleston campus is available at <http://ehs.cofc.edu/laboratory-and-research-safety/chemicalsafety/chemical-hygiene-plan.php> and a copy of the plan at <http://ehs.cofc.edu/laboratory-and-researchsafety/chemical-safety/chp.pdf>.

Laboratory Schedule		
Week	Laboratory	Assignment
1	Safety Training and Introduction to the Lab	None
2	Ammonia Assay	Record unknown in lab notebook
3	Ammonia Excretion in Marine Organisms	Report excretion data to professor
4	Ammonia Excretion in Marine Organisms	Write Title Page, M&M, Results, Discussion, Literature Cited
5	Phenoloxidase Activity in Crustaceans	Report data to professor
6	Phenoloxidase Activity in Crustaceans	Report data to professor
7	Osmoregulation	Record data and post online; plot graphs using SigmaPlot
8	Writing workshop	None
9	Osmoregulation	Record data and post online; plot
10	Oxygen Uptake	Report data online
11	Oxygen Uptake	Write Title Page, M&M, Results, Discussion, Literature Cited
12	Hemocyanin Function	Report data online
13	Hemocyanin Function	Write Title Page, M&M, Results, Discussion, Literature Cited