

BIOLOGY 390: ANIMAL PHYSIOLOGY
Fall 2009 Course Information Sheet
Dr. Ken Prestwich

Class Class on M, W, and Friday at 9 AM in O'Neil 101
Phys. Lab Mondays 2 to ~ 5 PM in the Genetics Lab (O'Neil 313)
Office O'Neil 108

Office Hours	M & F	Early-bird special: 7:15 AM - 8:15 AM
	T	8-9:30 AM
	W	2-4 PM
	F	4-5:30 PM

Review Sessions We will have review sessions in the late afternoon about every two weeks as needed.

Textbook Schmidt-Nielsen, K. **Animal Physiology** 5th edition (1997) New York, Cambridge University Press. **Note that this is an oldie but goodie and is used mainly as a supplement in our course – most reading materials are on-line but you do need to read this text.**

Course website and CLASS SCHEDULE:

<http://www.holycross.edu/departments/biology/kprestwi/physiology>
(updated after each class)

INTRODUCTION: This is a course on animal physiology. The approaches we will take will be comparative (evolutionary), ecological (adaptational) and medical (physiological function in health and disease). We will look at physiology from a number of different levels of the biological hierarchy from the whole organism down to subcellular. The unique approach to this course (compared to other bio courses at CHC) is that we will frequently take a biophysical approach. Please note that although we will spend a lot of time on human/mammalian physiology, this is a course on animal physiology. The blend of approaches you receive here will be excellent preparation for graduate school in physiology or zoology and for professional schools such as medicine and veterinary medicine.

COURSE GOALS

1. **To learn and critically examine the factual basis to physiological systems.** However, simply learning a about isolated systems is not enough. This course will stress:
2. **To learn how to think about physiological interactions**, in short, **to learn how to think integratively**. A primary attribute of good physiological thought is the ability to study systems first in isolation and then equally as important, to integrate your understanding of these systems such that you see how they work together to produce the whole. I am quite aware that most courses you take her do not emphasize

integration or pay lip service to it. In many ways, your most difficult task this semester will be to learn to predict the whole from the parts, as much as that can be done. The only reason we are really interested in individual physiological systems is to understand how they interact -- to be able to predict the changes in overall function as a result of perturbations on different systems. See further notes below on how to study for this course because integration is something I can help you learn how to do but most of the burden falls on you.

3. **To improve oral communication skills.** The way this will be achieved is through a rather different type of class format (see below) that will require your active participation and responsibility.
4. **To learn the use of instrumentation and experimental methodology used in some branches of physiology.** Note that one important approach, **experimentation that involves surgery on intact living vertebrates will not be used in this course.** I take this stand simply because at this level I find that the benefits students gain from these exercises are not justified by the pain, discomfort, loss of life, and additional costs. They are fully justified in most areas of research but I have been unable to ethically justify their use in training individuals who with only a few exceptions do not plan careers in physiology.

CLASS FORMAT

You are expected to attend and participate in class. This is an active learning course. You should think of each class period as a combination review and discussion section. The normal format will be that I will go over any portions of the notes (see next section) or readings that are not clear. I may go over the topics in slightly different orders than the one in which they were presented. It should not be necessary to go over all of the notes if you have been doing your part. Next we will deal with questions that are posed on the notes and, more importantly, ones that you raise regarding the ramifications of the material. In addition, we will go over assigned problems and I will ask a series of questions designed to help you learn to see inter-relationships between the materials and to help you learn to ask questions like a physiologist. You should not be taking very many notes in class.

CLASS NOTES

Notes for each lecture will be available on the class website well ahead of the class where they will be discussed. **IT IS YOUR OBLIGATION TO HAVE READ AND LEARNED AS MUCH OF THE NOTE MATERIAL AS YOU CAN BEFORE THE CLASS MEETING WHERE IT WILL BE DISCUSSED.** Furthermore, you are to have done any other assigned readings before this class. The main stress will be on the notes, however. If you are stressed for time, at minimum read and learn as much of the note material as possible. In addition, take the time to write down questions you have that either deal with understanding the notes or with further ramifications or inter-relationships in the

material. Please see further information regarding grading and class participation at the end of the grading section.

REVIEW SESSIONS: There will be a late afternoon review sessions every couple of weeks. Come to as many of these as possible, they are invaluable. Each session is set to deal mainly with the most recent material and with integrating it with what have done earlier. Exams are all on Mondays and so reviews will typically be given on Friday.

MOODLE AND THIS CLASS:

Class materials are all found on the website -- not on Moodle. We will use Moodle for a discussion board and place to post questions. More about this in class.

GRADING

Most of the work in this course is in class; hopefully lab will be more of a time to enjoy ourselves and deepen our understanding of some physiological phenomena and their measurement. We also use three lab periods for exams. Lab grading is detailed at the end of this document.

Class will account for about 82% of the total grade and lab for the remainder. Lab grading and lab seminars will be discussed in lab. The following is the approximate breakdown of points (approximate because sometimes I. There is also an opportunity to do a 35 pt extra credit lab project (see end of this document).

Measure	Points Each	Total, % Grade
Three In-Term Exams	~100 (varies a bit – 100, 110, 110)	320 (~46%)
Comprehensive Final Exam	170	170 (~24%)
Class Discussion, and any hand-in homework.	80	80 (~11%)
	Total From Lecture:	550 (~82 %)
Lab	120	130 (~19%)
	Total:	700 (100%)

Exams: Exams will consist of the following types of questions (with the percentages equally the approximate points for each type of question): multiple choice, (15%) identifications (10%), short answers (25%), essays (25%), and problems (25%)

Questions will cover class *and* reading material. **No credit is given on problems unless a neat and full explanation of the work is provided.** It is

my policy to give the composition of the exam within a few days before it is to be given.

All exams are comprehensive. Physiology is integrative, not compartmentalized. This policy is to encourage you to review material throughout the semester, to look for connections, and to avoid cramming for exams. That said, most questions on a given exam will be on new material and comprehensive questions will either deal with areas where most people did poorly on a previous exam or where there is significant overlap with the new material.

Exam questions are my property and are not returned with the exams. They may be looked at in my office or in the lab.

Make-up Policy: Exams may be made up only if a Dean's excuse is submitted and only in the event of substantially disabling illness or due to a *bona fide* family emergency. If you must miss an exam due to participation in a College-sanctioned activity (example: athletics), you must make arrangements with me at least a week prior to the exam; normally such make ups will occur the day before the exam. For all other circumstances -- for example other tests or papers due the same day -- please do not come and ask me to allow you to take an examination at a later date as it will put both of us in an uncomfortable situation. Failure to take a test as scheduled without a legitimate reason (listed above) will result in a test score of **zero**.

Note -- I generally will not give final exams early.

Midterm exams will be given in the lab periods (see schedule). **Class will meet on the days of the exam to go over new material. but we will** The purpose of giving exams outside of the normal class period is to allow some extra time for you to think. However, the exams are designed to be completed in about 1 hr.; the extra half hour is in case you get "stuck". It is not to encourage inordinately long answers to questions.

- These are **NOT open book exams**.
- **You are required to remember equations** -- they are succinct statements of relationships important to physiology and for that reason should be known as well as any description or term.

Note: I do not give out or post old tests so please don't ask. Every set of course notes contains many test-type questions and you will be given a large number of homework problems. However, don't expect to see exactly the same problems or questions on exams -- the idea is to learn a method to solving these problems, not to learn how to do a particular example or answer a specific question.

Class Participation: Note that about 9% of your final grade comes from class participation. The purpose of each of these components should be evident from

what you have read above. This is a course that requires that you must keep up; these are mechanisms to encourage you to do so.

Class Participation: You will be graded on your participation after each class. I will either call on you -- or ask for hands, but expect to be called on. You may request on a maximum of 2 occasions not to be called on (please, make such requests just before class).

Grading will be based on whether or not I believe you are prepared (meaning that not only had you read and tried to learn the material before class but also that you had thought about it, especially in regards to questions in the notes).

- Each week you will receive a grade of 0 to 1.0; at the end of the semester these will be averaged and adjustments will be made for excessive absences; the result will be your participation grade. You may see your participation grade anytime and I report it on your returned exams.
- **If you always attend class but say nothing and do not generally appear to have prepared thoroughly for class you will earn a 0.33.**

Quality of class participation – simply answering "soft ball" questions (e.g., things that proved you read the notes or otherwise required no thought) will earn you 82% (B-) participation mark. Higher marks depend on not only those types of answers but occasionally attempting more difficult questions or coming prepared with interested germane questions that stimulate class discussion.
Participation via MOODLE will help your class participation average.

Your overall participation grade (0 to 1) will be reported to you on your exams. Participation points are easy points to earn, so take advantage of the opportunity.

A note about power point. The class notes and readings are the heart of the course. The PP I use in class is simply a direct derivative of the handout materials (graphs and pictures copied from the notes for the purpose of explanation and discussion.) Therefore it is not posted in this class. Previous experience has taught me that people with access to the PP for this class do not pay appropriate attention to the details in the readings and as a result their grades suffer. Thus, PP is de-emphasized. Emphasize the note and reading questions.

Homework Problems: Class problems will only be graded if I feel that people are not doing the assignments as they are assigned. It is important to try them soon after the classes where they are discussed so that connections between the problems and other content can be made. On the other hand, lab problems will commonly be handed in the day of lab (in class.)

CLASS, LAB, AND EXAM SCHEDULE OF TOPICS

The schedule is at the class website:

<http://www.holycross.edu/departments/biology/kprestwi/physiology>

You will find all the files you need for class and lab there; they will generally be available at least a week before needed. All are pdf (Adobe Acrobat) documents and all are tested before being sent to the web server. If you are unable to read a document, I suggest that you go to another machine or that you obtain a new copy of Acrobat Reader. If you repeatedly have problems with a given document, please report it to me.

OTHER

CALCULATORS: you will need a calculator that does logs (bases 10 and e), exponentiations, and roots. Please always bring it to class with you.

CELL PHONES: Be sure they off in class, exams, lab, and review sessions.

FOOD, MUSIC, etc.: You may bring food to class; lab policy varies from week to week so please ask. Please do not bring music to lab.

LAB

Lab is worth about 19% of your total grade. **Lab should be fun.** The labs tend to be human oriented and they will give you experience on equipment that you are unlikely to have seen in other courses. Individual labs go well with the course material although not all course material has a counterpart in lab (excretion and kidney function is the glaring omission).

Lab grading: your lab grade is based on three components:

- **Participation (10%)** My subjective impression of your involvement in all aspects of the lab – are you prepared, interested, and do you readily take your turn at tasks (good) or do you prefer to be the experimental subject week after week (not good). Are you careful and willing to redo an observation if it is questionable?
- **Questions on lab exams (35%)** (Given with each exam – short answer questions, should take about 10-15 mins to complete.)
- **Presentations & Homework (40%)** the quality of your presentations on two assigned lab topics – one early in the semester and one late in the semester. These are to be 10-minute presentations. You will also be graded on your questions to other students.

Lab Project (15%) You will do a short experiment that builds off one of your previous lab experiences and one that is "OK'd" by me. Experimenter groups will consist of two individuals. The work must be done in lab and you will present a 10 min. oral report of your work in the final lab period.