

Student Orientation

Systems & Integrative Physiology

Overview:

This course is an upper level physiology laboratory course. We have approached teaching advanced physiology in the laboratory from a unique perspective, that of a research lab (within time (4 hr lab/week) and monetary constraints). Students are expected to take the initiative to prepare for the lab and when creating their lab reports, to do so in the form of a journal article. This course takes considerable time and effort. The reward is the ability to think independently, troubleshoot, and learn current techniques that are useful in research, graduate and medical school.

General Information:

The syllabus (attached at end) will list Lab #, date, section, and topic for each lab.

Grading:

Category	% of total.
Midterm I:	10
Midterm II:	10
Final (concurrent with Midterm II):	10
Quizzes:	12
Reports:	21
Orals:	12
Abstracts:	12
Debate	7
<u>TA's Evaluation:</u>	<u>6</u>
Total	100

Expectation:



At the first Lab meeting the TAs will explain their expectations of the students.

The students will provide their expectations of the course and TAs and other information on the attached section (see pg.'s 8 & 9).

Lab Handouts:

These will be available through an on campus print shop. . They will also be available on our course server and via our web page (http://mipwww.life.uiuc.edu/404_Master_Page.html).

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Lab Reports:

These will be 5 pages long or less. While students are working together in lab, this does not mean that they can share writing their reports. All authoring of text and graphics is to be unique and individual. There will be NO exceptions!

The lab reports will be due one (1) week after the lab is completed. Late reports will be penalized 10% of available points for the first week late and zero (0%) after that (their submission is still required for successful completion of the course).

Format:

1. Must be typewritten (i.e. word processor).
2. Must have the following form:
 - A. **Introduction (15%).**
 - a. Introduce theory and WHY you are doing the lab. Include the goals you hope to achieve.
 - b. Give a clear statement of purpose of the experiment. Present the question(s) which the experiment is trying to answer. All background information which justify your statements and the questions is to be referenced.
 - B. **Materials and Methods (15%).**
 - a. Briefly summarize the lab methodology and reference the manual for details. Include anything done differently from the lab handout.
What did you do? Describe any deviations you made from the lab handout.
 - C. **Results (30 %).**
 - a. At least one (1) figure (computer generated **not** hand drawn). Do not simply Xerox data (i.e., pictures, waveforms, or tables).
 - b. Summary Table(s) (not just printouts from spreadsheets).
 - c. All Tables/Figures are to be numbered and have a legend. All are to be referred to by these numbers in the text.
 - d. Two or three concise paragraphs describing your data. Don't explain results-- put that in the discussion. Do not put data at end of report include in results section. When using averaged data, be sure to indicate n (# of trials) and the SEM!.
 - D. **Discussion (30 %).**
 - a. Link your observations (or lack there of) to referenced theory or lecture in 402, if you are taking it.
 - b. Explain the results expected and the results recorded. Suggest why the data deviated from the expected. Finally, provide a brief summary of the experiment. This section is frequently the only part of a scientific paper which people read. It should be able to stand independently of the rest of the paper.
 - E. **Reference (5%).**
 - a. Support all statements not supported by your own data with referenced work. Correct format is required. See Reference Guide on Course web page.

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Oral Reports:

These will be done by each group and be 15 minutes long.

They will be given in front of the section at a time your TA will announce.

- Format:
- A. Intro
 - B. Materials & Methods
 - C. Results
 - D. Discussion & Conclusions

Abstracts or Summaries:

These will be done by group and be 1 page in length. They will be due 1 week after the lab.

Format: A paragraph or two discussing the pertinent points of the lab and results. All members of the group need to be involved in the authorship. A summary graph or table can be included.

Quizzes:

These may cover material from the previous lab and general concepts and methods from the current lab. Quizzes will require students to apply what they have learned in the previous lab exercise to theory and test their preparation for the current lab exercise.

Data Sheets:

These are found at the end of each lab. Each group are **required** to fill them in completely and handed them into the TA at the end of each lab. The data is also to be entered into the Excel data file for the group and/or section found on the server or created from the template found on the server.

Attendance:

You must attend **all** labs and actively participate. Unexcused absences will result in a zero grade for that lab exercise. If you miss a lab you must make it up. Please contact your TA in advance to make appropriate arrangements. You may NOT use someone else's data to write up your lab report (unless cleared with your TA). If missed labs are not made up in a reasonable time period you will then receive an incomplete for the course.

Each TA is responsible for her/his own section, including teaching and all grading. They are the primary instructors and the first person to see if you have any problems.

Exams:

There will be three exams. Two Midterms and a Final. The first Midterm will be approximately midway through the semester. The second Midterm and Final will be at the end of the semester. The Midterms will be two (2) hours long and cover approximately half the material each. The Final will be held concurrently with the second Midterm and be one (1) hour long. This final will be comprehensive and cover the entire semester.

Reviews:

The TAs may choose to hold review sessions before the exams. Check with them as to the time etc. of these.

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Why have Laboratory Experiments?

Provide opportunities to learn experimental techniques. Become familiar with the scientific approach to problem solving and the correct design of experiments.

Show the experimental results upon which the theories, taught in lecture, are based.

Goals:

Learn CORRECT experimental protocol and data manipulation.

Learn that data reproducibility depends on one's attention to detail. You will be graded on the accuracy of your observations, so take every effort to be as exact and as careful as possible.

Learn new and current techniques that will be used in the work place, i.e., hospitals/clinics/labs.

Learn to handle equipment correctly and carefully including correct calibration techniques and troubleshooting.

Learn the importance of control experiments and their design.



Animals

We will be using experimental animals (frogs, rats etc.) to obtain tissues for the laboratory exercises. In all cases the number of animals will be kept to an absolute minimum necessary. As part of the labs you should learn respect for animals and their condition/"feelings" without becoming anthropomorphic (as in Jonathan Livingstone Seagull).

You should be aware that by treating the animals with consistency and care, data fidelity is increased, thereby increasing the quality and reproducibility of the experiments. This will reduce the number of animals needed.

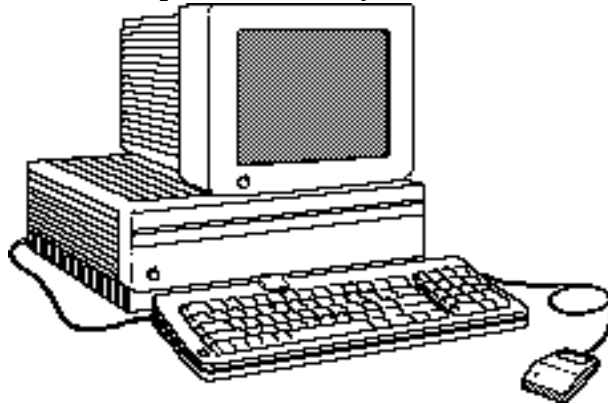
Animals used in these laboratories have been procured from USDA licensed suppliers and have been cared for under the guidance of the Office of Laboratory Animal Care, which is responsible for assuring that federal regulations on the use of laboratory animals are met. The protocol for all experiments using animals has received prior approval by the University Laboratory Animal Care Advisor Committee.

Some animal dissection and the use of animal tissues are required in this course. Alternatives are not available. Inquires concerning the use of dissection and animal tissues can be directed to the instructor or Head of the Department.

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General Thoughts on Data Acquisition/Analysis/Presentation:



Know what kind of data you expect to see in lab, its form and units and eventual use to support or dispute a theory.

Learn to be consistent with your data recording techniques within your group so that everyone understands what the numbers and observations mean. A good rule of thumb is that when you look at the data in 6 months from now you should be able to understand what you did.

This consistency will also apply across the lab to other groups and other lab periods when we need to pool our data.

We will be keeping records of all data collected in the labs in spreadsheet format. **ALL** sections/groups are **Required** to enter their data no later than the Friday of the week the lab was held in. All entries will include **name(s), date(s), and section number(s)**! It is imperative that all students are aware of this and adhere to it. Pooling of data from the entire class will allow you to compare your work with others and look for agreement/disagreement and or new trends/ideas that would not be obvious from a small sample. Students and/or TAs that do find these trends/ideas are encouraged to announce these findings.

You will be placing all data in files/folder in a “Student/404 Folder” set aside for you on the hard drives of each work station and the server (afp://commons2.life.uiuc.edu). You are allowed only on these areas of the hard disc and server and no others!! If you store files elsewhere I will erase them!!!

You will be shown how to use this equipment, BUT we expect you to learn it. Don’t ask how to do something at the end of the semester that you should have learned at the beginning.

Demo files and Template files will be placed in the folder for that week’s lab. They will be locked so as to prevent overwriting. You should open them and then save them into a file named something else appropriate, such as “**Resp/404/sect 1/Alpha**”.

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Servers

To access data, handouts and the like on our server, simply log on to the server (afp://commons2.life.uiuc.edu). ALL CITES sites support access to our server. :

Open the folder **MCB 403-404**, and then the folder **404-Spring 2009**

Microcomputer sites.

There are a number of sites across campus. Check with CITES for a current directory and available hardware and software. You can log into our servers from these sites. Remember that there are a number of different ways to put together a Macintosh system. This can result in smaller screens than we have in the lab and less memory. I suggest you try to get to a Mac to do your work. We use Mac running OSX.

Computer files:

Always back up important files (Such as abstracts, reports etc.). Protect them and learn what to do if they become unreadable. There are tools (software) to recover this information. Contact CITES at <http://www.cites.uiuc.edu> for how to do this

The excuse that your dog ate your USB drive will not be accepted.

People, Places and Numbers

<u>Name</u>		<u>Office</u>	<u>Phone #</u>
Carl Malmgren	Lab Director	Rm 230 Burrill Hall (Lab) Rm 220 Burrill Hall (Office)	3-1720 4-6574
	E-Mail:	Malmgren@uiuc.edu	

TAs

<u>Name</u>	<u>Section #</u>	<u>Office</u>	<u>Phone #</u>
Vanessa Noboa	1 & 5	414 BH	244-5741
	E-Mail:	vnoboa2@uiuc.edu	
Brian Wilson	2 & 4	2514 Beckman Institute	265-0491
	E-Mail:	bmwilson@illinois.edu	

Labs:

<i>Section #</i>	<i>Day</i>	<i>Time</i>	<i>TA</i>
1	Monday	2-6 pm	Vanessa Noboa
5	Tuesday	8 am - 12 noon	Vanessa Noboa
2	Tuesday	1-5 pm	Brian Wilson
4	Thursday	1-5 pm	Brian Wilson

Lecture:

Lectures will be held Mondays 12-1 pm in 165 Noyes lab, except on Martin Luther King Holiday (1-19-09), so Lecture will be at 12 noon Tuesday 1-20-09) in 124 Burrill Hall.

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Systems & Integrative Physiology Syllabus

Lab #	Dates	R	O	A	Experiment & Notes
	1-20-2009				Orientation. TAs gives her/his introduction. 124 Burrill Hall
Lab # 1	1-26-2009		O ₁		Basic Neuro-Physiology.
Lab # 2	2-02-2009		O ₁		Experimental Neuro-Physiology. ¹
Lab # 3	2-09-2009	R ₁			Human Respiration Physiology.
Lab # 4	2-16-2009			A ₁	Cardiovascular Response to Exercise ¹
Lab # 5	2-23-2009			A ₂	Human Skeletal Muscle Physiology.
Lab # 6	3-02-2009		O ₂		Simulation of Cardiovascular Physiology ¹
Lab # 7	3-09-2009	R ₂			Autonomic Control of the Cardiovascular System
Lab #8	3-16-2008 3-17-2009 3-23-2009		Debate		BioEthics debate Midterm I: Tue. March 17, 7 to 9 pm in 124 Burrill Hall Covers Labs 1 - 7. Spring recess. NO Class.
Lab # 9	3-30-2009	R ₃			Endocrine Physiology (Implant) I.
Lab #10	4-06-2009	R ₃			Endocrine Physiology (BioAssay) II.
Lab #11	4-13-2009	R ₃			Endocrine Physiology (ELISA) III.
Lab #12	4-20-2009			A ₃	Hormonal Control of Active Na ⁺ transport.
Lab #13	4-27-2009 5-05-2009			A ₄	Human Renal Physiology. Midterm II & Final. Tue. May 5, 7-10 pm in 140 Burrill Hall Covers Labs 8 - 13.

¹ Student directed lab

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Student Expectations.

Please take time tell us your Expectations in this course (we already know you “expect” an A in the course).

1.

2.

3.