Biology 165U: Systems Physiology Laboratory

INTRODUCTION

This lab is designed to provide hands-on experience with human physiology, using an inquiry-based approach. You will be required to read the primary scientific literature, collect, analyze and present data, and write thoughtful analyses of the lab activities. In the final two weeks of the semester each lab team will design and execute their own experiment. In the final lab week, each team will present its project in a 10-minute Powerpoint presentation.

This course consists of one four-hour laboratory session a week, plus additional time outside of lab that will be needed for library or computer work. Student teams will be writing protocols, methods, results, and discussions in the format of scientific papers submitted for publication.

We hope that you have fun in this course and we welcome your comments, critiques, and suggestions.

Prerequisite: Credit for or concurrent enrollment in BIO 365S (Vertebrate Systems Physiology, formerly Vertebrate Physiology II) is required. Students in the class who do not have this prerequisite due to the curriculum change should expect to do additional background reading to ensure that they understand the physiological concepts being covered in the lab experiments. Please notify your instructor if you do not have the BIO 365S prerequisite.

Course Goals are to:
1. allow students to experience the physiology they have studied in lecture
2. give students an appreciation for structure-function relationships of the human body
3. give students experience collecting, analyzing, and presenting data
4. give students an appreciation of the variability inherent in a population of humans
5. give students an understanding of the difficulties inherent in designing experiments using human subjects
6. have students work together effectively in teams

COURSE OBJECTIVES FOR Biology 165U

Students who complete this class should be able to:

1. describe the basic anatomy and physiology of various organ systems studied in the lab.
2. search, read, evaluate, and properly reference the primary literature.
3. design a controlled experiment, write a protocol for it, and execute it.
4. analyze and critique the design of experiments of others.
5. collect appropriate data, analyze it, and present it in the most appropriate form (graph or table).
6. use simple statistical analysis, including Student t-test, paired t-test, and linear regression.
7. write and cite in correct scientific format.
8. present an experiment as a Powerpoint presentation.
9. use Excel for spreadsheet, data analysis, and graph construction.
10. use a word processing program such as Word to write and import graphics.
11. use basic lab equipment including computer data acquisition systems.
12. cooperate with classmates and work effectively in teams.
BIO 165U COURSE INFORMATION

Course Director: Dr. Jan Machart. Office: PAI 3.10-D 471-6985
E-mail: janmachart@mail.utexas.edu
Office Hours: posted in Blackboard

TA name _______________________________________________________________

TA contact info __________________________________________________________

TA office hours ___________________________________________________________

Lab manual (required): Departmental Lab Manual will be available in print from the Co-op. It is your responsibility to bring the appropriate printed pages to lab.

Books: Human Physiology: An Integrated Approach 5/e. Silverthorn. This is the text for BIO 365S and readings will be assigned from this book.

SUPPLY LIST:

Required: Flash drive for saving lab data or ability to use UT Webspace

We strongly recommend that you SAVE AND BACK UP YOUR FILES. Computer crashes and lost flash drives are not an excuse for being late with an assignment. Use your Webspace to store backup copies of files. Keep all files until grades are submitted at the end of the semester. “I erased the file” is also not an excuse in case something happens to your original.

Optional: Copy paper for printing in the laboratory. There is limited printing in the BioSci computer lab in ACA.

Supplies and equipment: All students wear closed toe shoes in lab and must use safety goggles, gloves, and other personal protection equipment if the experiment requires it.

Electronics: NO LAPTOP OR CELL PHONE USE IS ALLOWED IN LAB unless required for special accommodations.

GRADING:

This class is not graded on a strict 90-80-70 scale due to variations in grading rigor among the different teaching assistants. If you have an “easy” TA, it is possible that you can get a C with an 81% overall average. Conversely, if your TA is demanding, it is possible to get an A with an 88% average. Students whose performance is significantly below that of their classmates are likely to make a C or lower for the semester. We will use the plus-minus grading system.

Most grades in this class will be given as TEAM grades. The grade assigned to the team will be the grade for each individual in the team – no exceptions. If you feel that someone in the team did not cooperate or
did not do his/her share of the work, you should use the peer evaluation part of the class to indicate this. See the section on peer evaluation.

**Grade breakdown:**

* Starred items are individual grades. Everything else is a team grade.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Team projects</td>
<td>30%</td>
</tr>
<tr>
<td>Revised project proposals</td>
<td>10%</td>
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<tr>
<td>IRB &amp; informed consent forms</td>
<td>5%</td>
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<tr>
<td>Human subjects certification*</td>
<td>5%</td>
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<tr>
<td>Final project presentation</td>
<td>10%</td>
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<tr>
<td>Peer evaluation</td>
<td>10%</td>
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<tr>
<td>5 team grades @ 1% each*</td>
<td>5%</td>
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<tr>
<td>Doing 5 evaluations*</td>
<td>5%</td>
</tr>
<tr>
<td>Reading quizzes* (6 @ 2% each)</td>
<td>12%</td>
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<tr>
<td>Results &amp; Discussions (4 @ 8% each)</td>
<td>32%</td>
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<tr>
<td>Homework from week 2*</td>
<td>2%</td>
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<tr>
<td>In-lab assignment grades (endo, CV I, resp @ 2% ea)</td>
<td>6%</td>
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<tr>
<td>Methods (RBC experiment)</td>
<td>2%</td>
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<tr>
<td>Literature search (diving)*</td>
<td>2%</td>
</tr>
<tr>
<td>Protocol (CV II lab)</td>
<td>3%</td>
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<tr>
<td>In-lab quizzes</td>
<td>1%</td>
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UT Austin provides, upon request, appropriate academic accommodations for qualified students with disabilities. Contact Services for Students with Disabilities, 471-6259 or 471-4641 TTY.

**WRITING ASSIGNMENTS:** Clear writing is an extremely important skill. Your TA and the course director are available to answer specific questions about writing lab reports. We will work with you as much as possible but we cannot be expected to correct long-standing writing deficiencies. You are encouraged to take your papers to the Undergraduate Writing Center for assistance with writing skills, particularly if English is not your native language. This service is FREE. Substandard writing will not be accepted.

**Penalty for failure to write two assignments.** There are eight group writing assignments (4 Results & Discussion, 1 Methods, 1 Protocol, 1 project proposal, and the IRB form-informed consent form). **Each student must write two of these.** Who writes what when is a matter for team negotiation. Failure to write two assignments means a zero for 2% of the final grade.

**Penalties for failure to contribute to team work.** If a student is identified by team members as failing to contribute his/her share to the protocol design, or to number crunching and data analysis-discussion for the Results & Discussion, that student will incur a 20% penalty for that grade. The penalized grade is calculated by taking the team’s grade and multiplying by 0.8. For example, the team’s R&D grade is an 85. Slacker Student then gets $85 \times 0.8 = 68$. 

8/24/10
Conversely, if the writer of a specific assignment does not accept input from his/her team members and this is apparent from the peer evaluations, the writer will incur a 20% penalty, calculated as described above.

**Blackboard deadlines** 40% of your semester grade comes from work that you will be doing in the last 5 weeks of the semester. The week-by-week schedule shows you what is due, when it is due, and what percent of your semester grade each assignment is worth. Reading quizzes and peer evaluation are set up as Blackboard tests with automatic closing dates, which are also listed on the schedule.

CLOSING DATES WILL NOT BE EXTENDED JUST BECAUSE YOU FORGOT TO COMPLETE AN ASSIGNMENT ON TIME! Failure to complete a reading quiz or peer evaluation means a 0 for the grade.

**LAB PERFORMANCE** We expect that you will be on time to lab, stay until all work is complete, and cooperate with labmates and instructors. You should exhibit a good attitude, cheerfulness, and interest. Each lab team should wash, dry, and store all glassware and supplies, and leave its workstation clean and organized. The TA will check each workstation before anyone is allowed to leave lab. If someone is consistently deficient in these attributes, we will document this and WE RESERVE THE RIGHT TO SUBTRACT UP TO 5% OF YOUR SEMESTER GRADE FROM YOUR FINAL AVERAGE FOR FAILURE TO PERFORM ADEQUATELY IN LAB.

**Attendance**: Roll will be taken in lab. Attendance will not be excused for illness without a written doctor’s note. The only excuse for missing class will be documented illness or death/major illness in the family, or other emergencies approved by the course director. It is NOT APPROPRIATE to schedule doctor/vet/car/interview appointments during your assigned lab time because there will be no makeups for unexcused absences. When you miss a lab, your absence also affects your team members. Students who miss quizzes without an excused absence will receive a zero for the missed quiz.

What happens if you miss a lab? Missing a lab or going to a different lab section one week due to illness or interviews does NOT excuse you from your responsibility to your team. You are still expected to contribute fully to the team’s work, even if you were not in the lab to collect the data with the team. In some instances you might be asked to work with the team in your makeup lab instead of your original assigned team.

**TEAM VS INDIVIDUAL WORK**: Learning how to work effectively with colleagues will be an important part of your post-college career, so this course is designed to give you practice in this area. Team members must be able to communicate effectively with each other and negotiate how to split the work. If your team members are not doing their share of the work or not interacting appropriately, you will be able to rate their performance through confidential peer evaluations.

You will be working in teams of 3-4 for these labs. All teams except the final project are assigned by the instructors and you will be required to change teams several times during the semester. You are expected to work together for all stages of each experiment. That means that you must be able to contact each other outside of the lab setting to collaborate on reports.

You will turn in peer evaluations for each team and for each member in the team. Peer evaluations are
done through Blackboard and the results of individual evaluations will be seen only by the instructors, so you can be honest about what you say. Written comments are essential if you give someone a low score.

You will be on 5 teams during the semester and your compiled peer evaluations count as 5% of your grade. Because it is important that everyone rates the other members of the team, completion of peer evaluations will also count as 5% of the grade.

If your evaluations indicate that you are not doing your fair share of the work, you will be warned.

**What kinds of things make a bad team member?** One of the most common complaints is failure to communicate, either by failing to answer messages or failure to participate in team meetings. We understand that some students hold jobs in addition to school, so you will be able to use Blackboard’s chat (“office hours”) function for virtual meetings by asking your instructor to set up a session for you.

**Doing all the work and not accepting team member contributions.** For all experiments where the team turns in a proposal, protocol, methods, or results and discussion, one member of the team will be responsible for writing the team report. All team members will get the same grade for this written work.

**WEEKLY QUIZZES:**

**Reading Quizzes** are short graded quizzes to ensure that you know what the week’s lab is about before you come to lab. They may also include information from previous labs if it is relevant to the lab coming up. Reading quizzes are set up in Blackboard and must be completed by midnight Sunday of the week of the lab. Reading quizzes are open book. If you fail to complete the reading quiz before the Bb site closes, there is no makeup.

**In-lab quizzes:** Unannounced and announced short quizzes will be given randomly in lab. The quizzes can include ANY MATERIAL covered in the course up to that point. You may use non-programmable calculators and should always have one with you.

Quizzes begin on the hour. If you arrive late, you will not be given extra time to complete the quiz. If you arrive too late to take the quiz or have an unexcused absence, you will receive a grade of zero for the quiz.

**PREPARATION:** During the beginning of the course we will be working on skills that are necessary for the rest of the semester, such as graphing, statistics, and making solutions. Learn these skills while they are the focus, as later in the semester we will assume that you have mastered them. Uncorrected problems in these crucial areas can make this class a painful experience, so ASK FOR HELP.

It is important that you come to lab fully prepared to do the exercise assigned for that week, with the lab handout in printed form. You should know not only what equipment you will be using, but how to use it, what you will be measuring, and why. You should arrive at lab prepared to begin immediately, knowing the material well enough to ace a quiz over it!

**GETTING ASSISTANCE:** This is an upper division course and it is your responsibility to ask for help if you are having difficulty. Your TA and the course director are both available during office hours and by E-mail to assist you or suggest another source of assistance. If you have personal problems that
interfere with your performance, please inform us of them in a timely fashion. If you experience problems with your lab team members, you will be able to tell us about them in your confidential peer evaluation forms.

**HOMEWORK**: Homework is due at the beginning of the lab period. It is considered late if it is not in the TA’s possession by ten minutes after the start of lab. Papers that are turned in later in the lab period will be penalized 5%. Papers turned in after the lab period will be penalized 10% of the total point value for each day or partial day the report is late. Extensions will be granted only for exceptional circumstances, such as a documented illness, death in the family, or apartment complex burning down. **THE USUAL LOAD OF ACADEMIA IS NOT AN ACCEPTABLE REASON FOR AN EXTENSION.**

**All lab reports must be typed, double-spaced unless otherwise specified.** Graphs must be computer-generated. You may send your reports to your TA by E-mail if s/he agrees. **Any questions about grading must be raised within one week of getting the work back.** No re-grades are possible after that time. Grading disputes between the student and TA will be resolved by the course director.

**ORAL PRESENTATIONS**: The last week of the semester, each lab team will present a 10 minute talk on their final project. The presentation and the experimental design/results will be graded by the other students as well as the TA and the course director. All members of a team will receive the same grade on the oral presentation.

**ACADEMIC DISHONESTY**

Academic dishonesty (cheating) will not be tolerated in any form. The most common form of academic dishonesty is plagiarism and unauthorized collusion.

Copying or paraphrasing someone else's work, whether a published paper, web page, or lab report, in whole or in part, is considered academic dishonesty. So is falsifying data. All written work you turn in must be your own, in your own words. **Lab reports that have identical written material or that are substantially the same** (i.e. occasional words added, deleted, or changed) **will be considered a scholastic violation and will be reported to the Dean of Students as such.**

You may work with your lab team except in those experiments designated as individual assignments. This means that you may share the work of doing data calculations and you may discuss the interpretation of the data with your lab team, but any written work must be entirely your own. Using someone else's data without permission of the instructor is not permitted.

Copying or paraphrasing material from another source, including the lab manual, without acknowledging the source is academic dishonesty. **Word-for-word quotations placed in quotation marks are rarely used in scientific writing and therefore are not appropriate in this class.** If you use outside materials, you must paraphrase them and cite them at the end of the lab report.

The penalties for cheating range from a zero on the assignment or test to an "F" in the course. Academic dishonesty includes (but is not limited to) cheating on exams and quizzes, altering tests after they have been returned, and failing to cite references or plagiarizing from references used in the case studies.
It is highly recommended that you read the site on academic integrity, published by the Dean of Students:
http://www.utexas.edu/depts/dos/sjs/academicintegrity.html

http://deanofstudents.utexas.edu/sjs/scholdis_plagiarism.php
http://deanofstudents.utexas.edu/sjs/scholdis_avoid_para.php

http://www.utexas.edu/lbj/students/writing/plagiarism.pdf
A Guide to Avoiding Plagiarism - LBJ School of Public Affairs

Students who violate the above rules will be called to a meeting with their teaching assistant and the course director. If the students dispute the facts upon which the charge is made or if they desire a hearing, the matter will be referred to the office of the Dean of Students. If the students do not dispute the facts upon which the violation is based, they will sign a written waiver of the hearing procedure and will be assigned a zero for the material in question. In all cases where an academic penalty is assigned, a Faculty Disposition form, signed by the student, will be filed with the Dean of Students.