BIOLOGY 3325: COMPARATIVE PHYSIOLOGY LAB (3 credit hours)
School of Biological Sciences

DRAFT SYLLABUS for SPRING 2020
Please note this is a draft syllabus

Instructor: Professor Neil Vickers
Email: n.vickers@utah.edu
Phone: 801-586-1930
Office location: ASB 360/362

Prerequisites: "C-" or better in (BIOL. 1210 OR BIOL. 1610) OR AP Biology score of 4 or better.

Course Description: Experimental analysis of physiological principles and mechanisms in animals. Design experiments, collect and interpret data gathered using both classical and contemporary physiological techniques. Entire class meets each week for one hour of lecture and discussion. Each section will then meet for four hours of laboratory on one afternoon per week. It is recommended that BIOL 2420 or BIOL 3320 be completed prior to taking this course.

Class Schedule:
Lecture: Monday: 12:55 - 13:45 JTB 130
Labs: Tuesday/Wednesday: 13:00 - 17:00 JTB 240/245
Discussion: Fridays: 12:55 - 13:45 JTB 130

Student Hours: I am available to meet with you during lab or after lecture/discussion sessions. I welcome you to contact me outside of class and am happy to arrange to meet with you in my lab/office (ASB360/362). The best way to reach me is through UMail (listed above). I do check emails on Canvas but not as frequently.

Teaching Assistants:
Tuesday lab section: Amanda Cooper (amanda.cooper@utah.edu)
Wednesday lab section: Kirsten Meredith (k.meredith@utah.edu)
Brian Le

Learning Outcomes – these are the specific skills and competencies that we will be working towards this semester. Hopefully, they will be useful to you in your daily life and careers.

- Work together in teams to accomplish goals
- Develop your understanding of design of physiological experiments
- Advance your skills in formulating and testing hypotheses
- Enhance your proficiency with respect to handling scientific data (analysis, appropriate display of results, and interpretation)
- Advance your understanding of basic statistical analysis
- Gain experience in making scientific presentations
- Understand that the process of science involves feedback and constructive criticism
- Develop an appreciation for the importance of failure and the iterative process to the scientific endeavor

Teaching & Learning Methods: I use a variety of teaching methods in this class including lecture, group discussions, team work, clickers, active learning and other engagement strategies. Similarly, grades in the class are earned through a diversity of assessments. I welcome student feedback (both formal course evaluations as well as an anonymous class survey conducted at the end of the semester). I use constructive feedback to improve the approaches that I use in teaching and evaluating
Grading:
Clicker questions ~ **100pts** (participation, attendance, polling and assessment-based questions during lecture, lab and discussion). Clicker points will be factored to 20% of final grade.
Lab attendance and participation: 8 lab sessions x 8pts per session = **64pts**
Lab reports: 7 reports x 25-30pts per report = **150pts**
  - Typically, due one week after your lab section – due dates will be announced in class and posted on Canvas
  - Submitted on Canvas, pdf format only; in order to maintain a level playing field for all students, reports should be submitted on time. There is a late report deduction of 5pts per day up to a maximum of 10pts. Your report is then graded as normal and your score is multiplied by the number of points available to you (i.e. less the deduction)
  - Note: You must attend the lab in order to submit a lab report. It is difficult to offer make-ups since the experimental set-up changes each week, but I will work with you under extenuating circumstances.
  - In order to provide consistency in grading across the class, each lab report is graded by one of the four TAs. We try to be as consistent as possible across the reports for different lab experiments but remember, if one TA appears to be slightly harder in terms of their grading, the same will be true for the entire class.

Group projects:
1. Group project plan = **20pts**; one-page document outlining the project (5pts) and a brief group presentation to the class (15pts)
2. Group project report = **100pts**; journal style report (individual work!)
3. Group project presentation = **50pts**; 10-minute presentation on project results
4. Group project peer review/participation = **30pts** (10pts peer review/20pts participation)

Total points available: ~**500pts**

Grade guidelines: **Everyone can do well in this class. My goal is to help you succeed.** If you attend and participate in class/lab, hand in reports on time etc. then you can expect to achieve a solid grade. If you fall behind then it is difficult to catch up – I will do my best to offer support if you are having difficulty keeping up.

Course grades will be determined as a percentage of total points. In the past, cumulative scores of 90% and above earn an A/A-. B range (B+ to B-): 89% to 76%; C range (C+ to C-) 75% - 60%; 59% or less results in a D. I reserve the right to make slight adjustments to these ranges depending on the performance of the class as a whole.

Course Materials: No textbook is required for this course. We will post laboratory protocols, announcements and additional materials needed to complete the lab reports on Canvas including due dates which will vary from lab to lab depending on the type of experiment.
Go to [http://www.utah.edu/students/](http://www.utah.edu/students/), click on “My Classes” on the right-hand side, log in, and then click on BIOL 3325. If you need assistance using Canvas call 581-6112 or visit the Canvas Support page. Use Canvas to upload your Lab Reports. The “comments” on assignments are NOT the best way to contact your TA. **Please email your TAs directly using the UMail addresses above with concerns, questions etc.**

Clickers: This class will make use of clickers during lecture and discussion. You are expected to have your clicker registered and active by the first lecture (Monday Jan 13). Please refer to instructions on Canvas for directions on how to register your device. Clickers are used to determine attendance, for polling and assessment purposes.
**AcqKnowledge software.** This class uses a hardware and software package from BioPAC to gather and view data for several of the lab exercises. A version of the software is available from BioPAC that you can download and install on your personal laptop or computer. While this version of the software will not allow you to collect data, you will be able to view and analyze data that you collected during lab class. Software can be downloaded from:

https://www.biopac.com/support/bsl-analysis-student-rsd-download/ You will need to select Windows or Mac BSL Analysis 4.1 depending on the platform you use.

**Class drop and withdrawal policy:** The last day to **drop** classes is **January 17th**; the last day to **withdraw** from this class is **March 6th**. Please check the academic calendar for more information pertaining to dropping and withdrawing from a course. **Withdrawing from a course and other matters of registration are your responsibility.**

**Incomplete** – There are 13 weeks of lab exercises scheduled in this class. You may petition me for an incomplete ONLY if you have completed 10 of the 13 labs (80%), and are unable to complete the course due to extenuating circumstances. Only very rarely will a student meet these requirements. Incompletes do not allow you to take a class a second time without paying tuition. An incomplete grade does not erase the scores from your current semester. It only allows you to make up the last one or two labs in the next semester that the class is offered.

University of Utah policy on incomplete grades:  
https://catalog.utah.edu/#/policy/B12v3LX0G?bc=true&bcCurrent=Grading%20Policies&bcGroup=Grade%20Information&bcItemType=policies

**Academic Conduct and Integrity**

In order to ensure that the highest standards of academic conduct are promoted and supported at the University, students must adhere to generally accepted standards of academic honesty. Acts of academic misconduct include cheating, plagiarizing, research misconduct, misrepresenting one's work, and inappropriately collaborating. Suspected cases of academic misconduct are dealt with according to the rules found in the Student Code, University Policy 6-400(V):

http://regulations.utah.edu/academics/6-400.php

“**Plagiarism**” means the intentional unacknowledged use or incorporation of any other person's work in, or as a basis for, one's own work offered for academic consideration or credit or for public presentation. Plagiarism includes, but is not limited to, representing as one's own, without attribution, any other individual's words, phrasing, ideas, sequence of ideas, information or any other mode or content of expression (from Student Code Section 1:B:2:c). Instances of plagiarism will result in a score of zero on any particular assignment or section thereof. Sanctions for plagiarism can include the submission of a written misconduct report to the College of Science.

You will work in groups for each lab exercise as well as your group project. I anticipate that graphs and other figures will be similar for each member of a particular group, since your data will be the same. Even if you discuss the best ways to present your data with your group, you are encouraged to present data from your experiments or project as you see fit. **However, written answers to questions in lab reports must be your own work. Copying or paraphrasing the work of another student is not acceptable.**

I have elected to use a plagiarism detection service in this course, in which case you will be required to submit your lab and group project reports to such a service as part of your assignment.
**Accommodations Policy:** I do not grant content accommodation requests as the course content fulfills legitimate pedagogical goals.

**Important Class Notes:**
Animal Handling and Safety: This lab involves handling live or recently euthanized animals. Health and safety training is available to students who feel that they would benefit from such training.

**University of Utah policies:** The University of Utah drop and withdrawal dates are on the class schedule. Also see [http://registrar.utah.eduacademic-calendars/index.php](http://registrar.utah.eduacademic-calendars/index.php)

**The Americans with Disabilities Act.** The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services. [http://disability.utah.edu/](http://disability.utah.edu/)

**Addressing Sexual Misconduct.** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran’s status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action ([https://oeo.utah.educontact/](https://oeo.utah.educontact/)), 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

**Student Names & Personal Pronouns.** Class rosters are provided to me with your legal name as well as “Preferred first name” (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your UIDcard, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

**Wellness.** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student’s ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at [www.wellness.utah.edu](http://www.wellness.utah.edu) or 801-581-7776.

**English Language Learners.** If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include: the Writing Center ([https://writingcenter.utah.edu/](https://writingcenter.utah.edu/)); the Writing Program ([https://writing-program.utah.edu/](https://writing-program.utah.edu/)); the English Language Institute ([https://continue.utah.edu/eli/](https://continue.utah.edu/eli/)). Please contact me to discuss any additional support you need.
for this class.

**Veterans Center.** If you are a student veteran, the U of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-F 8-5pm. Please visit their website for more information regarding the support they offer, a list of ongoing events and links to outside resources: https://veteranscenter.utah.edu/. Please also let me know if you need any additional support in this class for any reason.

**LGBT Center.** If you are a member of the LGBTQ community, lab should be a safe zone. Please contact Dr. Vickers if you have any problems with other students or TAs. Additionally, the U of Utah has an LGBT Resource Center on campus. They are located in Room 409 in the Olpin Union Building. Hours: M-F 8-5pm. You can visit their website to find more information about the support they can offer, a list of events through the center and links to additional resources: http://lgbt.utah.edu/. Please also let me know if there is any additional support you need in this class.

**Code of Student's Rights and Responsibilities** https://www.regulations.utah.edu/academics/6-400.html

**Research Opportunities for Undergraduates**
- UROP: https://our.utah.edu/urop/
- MUSE Project – research & community engagement opportunities https://muse.utah.edu/

**Note:** This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under Announcements.
## Draft Lab Schedule

<table>
<thead>
<tr>
<th>Week of:</th>
<th>Lecture (M)</th>
<th>Lab (T or W)</th>
<th>Discussion (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-Jan</td>
<td>Course Overview</td>
<td>No lab classes</td>
<td>No discussion</td>
</tr>
<tr>
<td>13-Jan</td>
<td>Introduction</td>
<td>1. Bioelectrical signals</td>
<td>Discussion I/Diving Reflex</td>
</tr>
<tr>
<td>20-Jan</td>
<td><strong>MLK Day</strong></td>
<td>2. Diving reflex</td>
<td>Discussion II (T-tests)</td>
</tr>
<tr>
<td>27-Jan</td>
<td>Scaling</td>
<td>3. Human lung ventilation</td>
<td>Discussion III</td>
</tr>
<tr>
<td>3-Feb</td>
<td>Skeletal Muscle</td>
<td>4. Leopard frog gastrocnemius</td>
<td>Discussion IV</td>
</tr>
<tr>
<td>10-Feb</td>
<td>Cardiac muscle</td>
<td>5. Bullfrog heart</td>
<td>Discussion V Osmoregulation</td>
</tr>
<tr>
<td>17-Feb</td>
<td><strong>Presidents Day</strong></td>
<td>6. Insect osmoregulation</td>
<td>Discussion VI</td>
</tr>
<tr>
<td>24-Feb</td>
<td>Osmoregulation</td>
<td>7. Insect osmoregulation</td>
<td>Discussion VII (ANOVA)</td>
</tr>
<tr>
<td>2-Mar</td>
<td>Project overview</td>
<td>8. Project planning</td>
<td>Presentation workshop</td>
</tr>
<tr>
<td>9-Mar</td>
<td></td>
<td></td>
<td><strong>SPRING BREAK</strong></td>
</tr>
<tr>
<td>16-Mar</td>
<td>Presentation workshop</td>
<td>9. Project Proposal presentations</td>
<td>No discussion</td>
</tr>
<tr>
<td>23-Mar</td>
<td>Projects begin</td>
<td>10. Project experiments</td>
<td>Project experiments</td>
</tr>
<tr>
<td>30-Mar</td>
<td>Projects continue</td>
<td>11. Project experiments</td>
<td>Project experiments</td>
</tr>
<tr>
<td>6-Apr</td>
<td>Projects end</td>
<td>12. Data/Figure workshop</td>
<td>Data/Figure workshop</td>
</tr>
<tr>
<td>20-Apr</td>
<td>Report preparation</td>
<td>Classes end Tuesday, April 21</td>
<td></td>
</tr>
</tbody>
</table>

### Important dates:
- Friday 17th January: Last day to drop/add class
- Friday 6th March: Last day to withdraw