Instructor:
• Alexa Tullis; Thompson 257E, x2857; atullis@pugetsound.edu.
• Office Hours: Set Office Hours TBA. Office hours always by appointment. Please call, e-mail, or ask in person if you would like to set up a time to meet. Please do not hesitate to make an appointment.

Required Text:
• Animal Physiology 4th ed (2016) by Hill, Wyse, and Anderson. Other editions are possible. Please let me know if you have a different edition.

Canvas Page: https://pugetsound.instructure.com/courses/2867

Course Description:
Biology 334, Comparative Animal Physiology is an upper level course designed to teach basic principles of animal physiology, and help students appreciate the value of the comparative method and the integrative nature of physiology. In addition, elements of this course promote good laboratory skills, teach aspects of physiological experimentation, and promote intellectual and laboratory independence. Finally, this course provides ample opportunity to refine data analysis and scientific writing skills.

Student Learning Outcomes: By the end of this course, students should have:
• developed an understanding of basic principles in animal physiology;
• acquired the ability to apply these principles to understand novel situations;
• refined the tools necessary for writing a solid biological research paper;
• refined the ability to design effective experiments, including appropriate controls;
• acquired many skills necessary to perform laboratory experiments in animal physiology

Basic Course Information:

Canvas:
Our Canvas page contains essential material for both lecture and lab, including lecture slides, laboratory exercises, exam study materials, worksheets, and outside readings.
• You will be turning in most assignments through Canvas.
• IMPORTANT: Unless otherwise stated, I will only accept Microsoft Word files for written work and Excel files for data. If I cannot open your file or if there is something wrong with it such that I cannot read it after I open it then I may consider the assignment not turned in.

Lectures: MWF 9:00-9:50 AM in Thompson 171
Class sessions are primarily an interactive lecture format, with some class discussion. In some cases you will be asked to do specific problems or other short assignments prior to coming to lecture. Although these assignments may not be collected they are important for keeping up with the lecture and may be considered when evaluating your class participation.
• The lecture schedule lists pages in your text associated with each lecture. Read these pages before lecture; it will enable you to get more out of the lecture and will help you answer questions when called upon. Re-read the associated pages after lecture, focusing on the material covered in lecture.
**Exams:**
There will be two mid-term exams and one final exam. **IMPORTANT:** To ensure that you are not rushed when you take the mid-terms, they will be given in the evening from 5:30 – 7:30 PM on the scheduled day*. Please make arrangement now to reserve those times. Lectures on those days will be devoted to last minute questions on exam material. Exams will primarily cover lecture material. *If the entire class can agree on another 2 hr block of time that works for everyone, I'm open to changing this.**

**IMPORTANT:** Make-up or early exams will not be given but adequate consideration may be given and adjustments may be made if there is a medical or family related emergency. Written documentation of the nature of the emergency may be required. The final exam will be given on Monday December 16th from 8-11am. As per university policy, “In all classes in which a final examination is given, the final examination must be given during the time period assigned by the Office of the Registrar, and instructors may not grant exceptions to this policy” (p. 10, *Academic Handbook*, https://www.pugetsound.edu/files/resources/academichandbook2018-19.pdf)

**Laboratories:** Harned Hall 235
Laboratory work is an important part of any course in animal physiology. The laboratory exercises are designed to introduce you to some important physiological techniques. You will be given an opportunity towards the end of the semester to use these techniques in an experiment of your own design. Another aspect of lab work that we want to expose you to in Comparative Animal Physiology is trouble shooting, which is one of the most important skills a scientist learns. Since this is not the aim of most college science laboratories, many of the lab exercises you have done in the past have been specifically designed to be foolproof. Because we are often working with live animals or preparations, it is virtually impossible to design foolproof animal physiology labs.

Labs are scheduled for 4 hours (please do not ask if you will get out early). Laboratory investigations during weeks 1 - 7 will be structured labs. Weeks 9 – 14 will be devoted to independent laboratory research, data and statistical analysis, and interpretation of results. **All laboratory exercises are available on Canvas.**

**Laboratory Conduct**
- As per department policy
  - there is to be **no food or drink in the lab room.** There will be a place to put these items outside of the lab room.
  - Students must wear proper lab attire as specified on the sign on the lab door. This includes eye protection.
- Animals must be treated with care and respect. It is a privilege to be able to work with them. Any instance of animal mistreatment will lead to a failing grade in this course.

**Structure of the standard labs**
All lab exercises for this course will be available on Canvas. Most of the time you will be working in groups of two, although a few labs will involve groups of four. All standard lab exercises will be preceded by a short introductory lecture and are designed to be completed in one lab period.
- **PRINT OUT A COPY OF THE STANDARD LABS AND BRING IT WITH YOU TO LAB ON THE DAY OF THE LAB.** If you arrive without a printed copy of the lab, I will ask you to leave and print one out. The bench space is often too small to accommodate students reading the lab on their laptops.
- **Pre-labs:** Pre-labs are due through Canvas by the start of your lab period (because they are PRE-labs, not late assignments will be accepted), and each student must complete
their own pre-lab. I’ve designed these questions to help prepare you for the experiment. Reading appropriate sections of the text will help you understand the physiological processes we are studying in each experiment.

- **Post-labs**: Standard labs have Post-labs associated with them. Each post-lab is slightly different and is described at the end of each lab exercise. Unless otherwise stated, these will be due by the start of your next lab period through Canvas.
- **Lab notebook**: Everyone must have an individual lab notebook, the type is up to you. The quality of your lab notes directly influences your ability to analyze your data and, thus, indirectly influences the quality of your post-labs and research papers. Because I feel so strongly that good notes are a major key to good science there may (or may not) be surprise checks on your lab notes.
- **Lab preparation and performance**: Throughout the term I will be assessing your lab preparation and performance. It is usually readily apparent if a student has not prepared adequately for lab because performance will be suboptimal.

**Independent projects**

You will have the opportunity halfway through the semester to design and execute a study that you and your research partner have designed. In designing your independent project, we encourage you to integrate and expand upon techniques you learned during the standard lab exercises, although you can also use a new technique if it is practical and informative. This is a time to further investigate physiological phenomena that peaked your interest or apply techniques that you found particularly enjoyable (more info on the "Independent Projects" handout).

**Research Papers**

Each student must submit 2 written research papers, one on a standard lab and one on your independent project. Each paper includes some kind of revision. The specifics for these papers vary and are outlined in the "Writing Assignments" handout. Completion of both papers is required for a passing grade in this class.

**Lab make-ups**

All labs are required and missed labs may result in a lower final course grade unless there is a family or medical emergency, proof of which may be required. Because labs are designed specifically for 8 people and constrained by equipment availability, no switching of lab sections will be allowed except in the case of a family or medical emergency. If you must miss a lab, you may be able to it up in any of the other lab sections, including those run by the other Animal Physiology professor (David Sulumeier, dsulumeier@pugetsound.edu). It is your responsibility to clear any changes with the professors in advance. Due to the time involved in setting up each lab, you will only be able to make up labs during the same week that your missed lab exercise is scheduled.

**Schedule of lab sections**

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Day</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tullis</td>
<td>Monday</td>
<td>12 - 4 PM</td>
</tr>
<tr>
<td>Tullis</td>
<td>Tuesday</td>
<td>1 - 5 PM</td>
</tr>
<tr>
<td>Sulumeier</td>
<td>Wednesday</td>
<td>1 - 5 PM</td>
</tr>
<tr>
<td>Sulumeier</td>
<td>Thursday</td>
<td>1 - 5 PM</td>
</tr>
</tbody>
</table>
General Course Policies

**Cell Phones & Computers**
- Please put cell phones on vibrate and in your bags during lecture and lab. If I see a phone on the desk, I will ask you to put it away. Repeated violations of this policy may decrease your overall course grade.
- I don’t mind if you use your computers during lecture to take notes, but please sit in the back row so as not to distract other students. Using computers for other reasons during lecture will be noted and you will be asked to stop. Repeated violations of this policy may decrease your overall course grade.

**Late Policy:**
Unless otherwise stated, assignments are due at the start of lecture or lab as indicated on the individual assignments and in the lecture schedule. Turning in an assignment late will reduce the maximum credit available by 10% per day, including weekend days. Work turned in late on the same day that it is due will be considered ½ day late and 5% of the points possible will be deducted from your earned grade. In addition to the policy described above, late assignments will not be accepted …
- if an assignment is in preparation for something occurring on the due date in lecture or lab;
- after 7 days past the due date;
- if there is not enough time to be evaluated before a follow up assignment is due;
- after 5pm on the last day of reading period.

TO BE FAIR TO ALL STUDENTS, THIS LATE POLICY WILL BE STRICTLY ENFORCED. I may waive the late penalty only if there is a medical or family related emergency. Written documentation of the nature of the emergency may be required.

**Sports Related Absences:**
If you are going to miss an exam or laboratory due to an athletic event, please inform me AT LEAST ONE WEEK before that date. If you need to make up a laboratory in another section it is your responsibility to make prior arrangements with me and/or the other Animal Physiology professor. As stated earlier, no make up exams will be given. However, it is possible that arrangements can be made with your coach so that you can take the exam.

In keeping with university policy, athletic practices are not excuses for missing or coming late to class or labs. Coming late or leaving early from lab or lecture due to sports-related events may result in a lower class participation grade.

**Official Classroom Emergency Response Guidance**
- Please review university emergency preparedness and response procedures posted at www.pugetsound.edu/emergency/\(<http://www.pugetsound.edu/emergency/>\). There is a link on the university home page. Familiarize yourself with hall exit doors and the designated gathering area for your class and laboratory buildings.
- If building evacuation becomes necessary (e.g. earthquake), meet your instructor at the designated gathering area so she/he can account for your presence. Then wait for further instructions. Do not return to the building or classroom until advised by a university emergency response representative.
- If confronted by an act of violence, be prepared to make quick decisions to protect your safety. Flee the area by running away from the source of danger if you can safely do so. If this is not possible, shelter in place by securing classroom or lab doors and windows, closing blinds, and turning off room lights. Stay low, away from doors and windows, and as close to the interior hallway walls as possible. Wait for further instructions.
University Policy on Academic Accommodations
I will make every effort to accommodate students with disabilities in both lecture and lab. If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of the Office of Accessibility and Accommodations, 105 Howarth, 253-879-3399. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. I request that students with disabilities contact me early in the term (preferably within the first week of class) to discuss accommodation. It is university policy that students who have not registered with the Disabilities Office are not eligible for accommodation. All requests for accommodation must be made in a timely manner so that I can adequately accommodate your needs; if you cannot meet with me early in the term, please give me at least one week’s notice for any event. Be aware that the CWLT requires advance notice for some accommodations (such as taking exams in the center).

Academic Integrity and Plagiarism
Several forms of academic misconduct are especially relevant to this class and deserve highlighting:
- Cheating on exams or quizzes.
- Alteration, fabrication or misrepresentation of data.
- Plagiarism on any assignment, including lab exercises. This includes written work and laboratory drawings.

To help refresh your memory about issues related to academic integrity and plagiarism, please review the material on the following page and take the associated academic integrity quiz (link on the right side or the bottom of the page, depending on your browser).

http://research.pugetsound.edu/c.php?g=304242&p=2028010

When you sign the Student Contract for this course, you are stating that you have read the information on this page, and completed the accompanying Academic Integrity Quiz, and that you fully understand what constitutes plagiarism.

It might also be a good idea to consult the Academic Handbook for how instances academic integrity violations are handled: See pages 4-6 in the Academic Handbook https://www.pugetsound.edu/files/resources/academichandbook2018-19.pdf

Any incident of academic dishonesty must be reported to the Registrar. Any penalty applied with respect to this course will depend on the severity of the violation. It is your responsibility to make sure that you understand this issue. Please ask me if you have any questions.
<table>
<thead>
<tr>
<th>Grading (subject to slight changes):</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterms (2 x 100 pts)</td>
<td>200</td>
</tr>
<tr>
<td>Final</td>
<td>200</td>
</tr>
<tr>
<td>Graded homework assignments (approx.)</td>
<td>35</td>
</tr>
<tr>
<td>Lab research paper: first submission</td>
<td>40</td>
</tr>
<tr>
<td>Lab research paper: revision</td>
<td>20</td>
</tr>
<tr>
<td>Summary of primary references #1</td>
<td>10</td>
</tr>
<tr>
<td>Summary of primary references #2</td>
<td>10</td>
</tr>
<tr>
<td>Introduction &amp; Methods Draft for Independent Project Paper (completeness)</td>
<td>10</td>
</tr>
<tr>
<td>Peer reviews of Intro. &amp; Methods</td>
<td>10</td>
</tr>
<tr>
<td>Final Independent Project Research Paper</td>
<td>100</td>
</tr>
<tr>
<td>Pre-labs (5 @ 5 pts each)</td>
<td>25</td>
</tr>
<tr>
<td>Post-labs (5 @ 10 pts each)</td>
<td>50</td>
</tr>
<tr>
<td>Lecture preparation and participation*</td>
<td>15</td>
</tr>
<tr>
<td>Lab preparation and performance**</td>
<td>15</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>740 pts</td>
</tr>
</tbody>
</table>

* This category refers to your apparent preparation and participation in lecture. I will assess your performance in this area by taking into consideration your attendance, the extent to which you prepare by doing the assigned readings and assignments (even those that are not graded), and how readily you participate during lecture.

** I will assess your lab preparation and performance during every lab session by observing your level of preparation and how directed and independently you work during lab. I will also be observing how thoughtfully you treat the lab animals and how clean you leave the lab space.
STUDENT CONTRACT
Comparative Animal Physiology (BIOL334) Fall 2019

Please sign the contract and return it to your professor by 9am on Monday, September 9th. Signed contracts are required to receive grades in this course.

I have carefully read the syllabus and know the correct answers to all of the questions on the Course Self-Test. I understand the content of the syllabus.

- I am aware of the mid-term and final exam dates and that the mid-term exams will be given in a 2-hour block of time outside of the regularly schedule lecture time.
- I understand that no make-up or early exams will be given.
- I am aware of the assignments, and I understand that assignments are due on the date and time stated. I understand that preparation assignments are not accepted late and that there is a penalty for any other assignment turned in late.
- I understand that labs are mandatory and that failure to attend lab for something other than a documented medical or family emergency may lead to a lower final course grade.

I have read the material about academic integrity and plagiarism contained on the Collin’s Library website as outlined in the syllabus.

- I have taken the Academic Integrity Quiz associated with the Library’s web page on Academic Integrity.
  - Take a screenshot of the first page of the quiz when you enter your name and email address
  - Take a screenshot of the last page when you are thanked for your time spent taking the quiz.
  - Submit these screenshots to Canvas by Monday September 9th at 9am.
- I understand what constitutes plagiarism.
- I pledge to refrain from any act of academic dishonesty, plagiarism or scientific misconduct.
- I understand that all written work must be completed individually by me unless the assignment specifically states otherwise. I understand that if I violate this policy, penalties will be applied.

NAME (PRINT) ________________________________________________

SIGNATURE  ________________________________________________

DATE  __________________________