

*This syllabus is a general representation of the course as previously offered and is subject to change.*

## **BIOL 363 – Laboratory in Animal Physiology**

General Course Syllabus (as of July 2019)

### **About the Course:**

**Course Description:** A course on experimental studies in animal physiology.

**Course Format:** Lecture, Laboratory, and Tutorial. 1 hour of lecture and 4 hours of practical lab work and tutorial per week. Students must register into the matching labs and tutorials, as the tutorial hour is scheduled just before and after the respective lab section.

**Credits:** 2

**Pre-requisites:** BIOL 204. Restricted to Majors and Honours students in Biology, Nutritional Sciences and Biophysics.

**Co-requisites:** BIOL 361.

### **Course Learning Objectives:**

The objectives of BIOL 363 are:

- To give students competent lab skills in animal physiology.
- To prepare students to carry out independent research in post graduate studies (e.g. Master's degree) or independent investigation in a biological related field (health care, law, etc.).

By the end of the course students should be able to:

- 1. Acquire basic laboratory skills** to safely and confidently handle live animals, human subjects, and basic physiological lab equipment; execute proper lab techniques such as isolation and extraction of organs and tissues, measuring biometrics, or preparing solutions from appropriate chemical reagents; and gain proficiency in using Excel, Capstone and LabPro to collect and analyze data.
- 2. Become proficient in applying scientific methodology in carrying out a research project**, from proposing and justifying hypotheses; predicting expected experimental results given protocols and hypotheses; designing and evaluating experimental protocols; analyzing individual or class data with large sample sizes; interpreting and comparing data with predicted results and those of similar experiments in the literature.
- 3. Develop information literacy** to determine what information is needed (and in what depth) when faced with a problem to solve; find needed information effectively and efficiently; critically evaluate the reliability of the information (peer-reviewed literature); and manage information collected.

4. **Develop scientific writing** skills to compose a lab report in a journal article format; make graphs to communicate trends in data; communicate ideas in a clear and organized way; explain experimental results using current knowledge of animal physiology; and concisely review the relevant literature on similar or related experiments.
5. **Understand basic concepts in Animal Physiology** including: transport of substances across cell membranes; enzymes; digestion; muscle physiology; neurophysiology; metabolic rate; endocrinology; thermoregulation; hematology; cardiovascular & respiratory physiology.
6. **Demonstrate teamwork, leadership, independence, and professional conduct** to work efficiently in a lab environment.
7. **Develop Life skills that will serve them well in their future professional and personal life:** Self-reliance and independent learning; assessing the reliability and validity of information; understanding and integrating information into a coherent framework; critical thinking, analytical and problem-solving; effective communication; professionalism & work ethic; teamwork and collaboration. Most importantly, students will understand that there are many “bad” ways and many “good” ways to tackle a problem and they will feel confident in assessing the pros and cons of each approach, pick one of the good strategies and forge ahead.

## Textbooks and Additional Resources:

### Required

- **Textbook:** Principles of Animal Physiology (3<sup>rd</sup> edition) CD Moyes and PM Schulte (Custom Access Code RVP will not be used)
- **iClicker**
- **Non-programmable calculator;**
- **Dissecting kit:** 2 pairs of scissors (medium and fine); 2 pairs of forceps (medium and fine). Available for purchase at the UBC Bookstore.
- **Lab Notebook:** Available for purchase at the UBC Bookstore or at Staples.  
Criteria:
  - Larger size: 9”x 11”
  - Approx. 200 pages
  - Bound (NO loose pages allowed); either bound spine or spiral binding
  - Students can pre-write page numbers by hand before coming to the lab
  - Recommended that students do not spend too much money on the notebook as it will be kept with the instructor at the end of the year
- **Lab wear:** (Click on the [minimum requirements for Personal Protective Equipment \(PPE\)](#) that an individual must wear in order to enter a UBC wet lab)
  - **100% knee-length, long sleeves white lab coat:** available at the UBC Bookstore

- **Long loose fitting pants** (long socks, leggings, nylons, and skinny jeans are not appropriate)
- **Full Covering Liquid Resistant shoes** (sandals, ballet flats, cloth, and mesh shoes are not appropriate)

**Optional:**

- **Safety goggles:** will be provided in the lab
- **Laptop**

**Evaluation:**

Assessment	Weight
Prep-lab quizzes & In-lab work	25%
Lab reports and Project	45%
Final lab exam	30%

MORE DETAILS ON ASSIGNMENTS

**In-lab work:** includes bench work, in-lab discussion, lab notebook checking, and online quizzes. Assesses the groups' level of preparedness, lab skills, organizational skills and efficiency, data collection and recording skills, teamwork, and behavior. Online quizzes test knowledge on general information about BIOL 363 and lab safety.

**Participation during lecture:** includes Clicker or verbal Q&As. Marked for participation only; no marks are removed for giving the wrong answer. These marks are added up and expressed as a value out of 10. If the participation mark works to the student's advantage, this will replace the lowest mark received in the in-lab work section.

**Prep-lab quizzes:** quizzes take place at the beginning of each lab. They can be clicker or short answer questions on worksheets. They are open lab notebook only, time limited, and taken individually unless stated otherwise.

**Lab reports & Group project:** unless stated otherwise, lab reports will be completed as individual assignments.

**Final lab exam:** this is an open-book written exam. Questions on the final will focus on:

- a) experiments, methodology, calculations, results, and interpretation of results obtained in the lab
- b) the materials derived but not directly related to the experiments completed in lab.

## Schedule of Topics:

Week	Lecture – Main Topics	Lab and Tutorial – Main Topics
1	Introduction to BIOL 363	No Lab or Tutorial Review online tutorials
2 to 12	Lectures prepare for the coming lab session	<p>Reviewing the Scientific Method Learning how to use Data acquisition software Learning how to write a paper</p> <p>Our inquiry based laboratory exercises as well as students' group projects will be chosen amongst the following topics:</p> <ul style="list-style-type: none"> <li>• Transport of substances across cell membrane</li> <li>• Enzymes</li> <li>• Hematology</li> <li>• Metabolic rate</li> <li>• Endocrinology</li> <li>• Pharmacology</li> <li>• Muscles &amp; Nerve physiology</li> <li>• Cardiovascular and respiratory physiology</li> <li>• Thermoregulation</li> <li>• Reproduction</li> <li>• Digestion</li> </ul>
13	TBA	TBA

*TBA: either guest speakers, review sessions or presentation of projects.*

## Course Policies:

1. **Be on time:** be respectful of TAs and lab partners.
2. **Do not miss lab & tutorial sessions:** Unless students have a valid reason<sup>(\*)</sup> for missing a lab session or for not collecting their share of the data, their total grade for BIOL 363 will be reduced by 10% per missed session. Any final exam questions and lab report related to the topic taught in that missed session will be scored as zero. Students may be asked to withdraw from the course if they are missing too many lab sessions.
3. **Be prepared before coming to the lab.** Students will not be penalized for not getting the “right data”. However penalties will apply if In lab, students do not demonstrate that they must do their best, prepare before coming to the lab, and work hard to collect their share of data.
4. **Hand in reports on time and at the proper location:** Instructors and TAs are not required to grade late lab reports.  
If students are less than 24h late, 50% of the grade will be deducted as a penalty.  
If students are later than 24h, they will receive a zero.  
If students have a valid reason<sup>(\*)</sup> for being late, it is their responsibility to contact the instructor as soon as possible. The grade of the missing report will be made up by the final exam.
5. **Do not miss quizzes:** there will be no make-up quizzes.
6. **Make sure the clicker is working and properly registered:** in the case of technical problems, the instructor may allow students to submit written responses to count for marks.
7. **Do not switch lab/tutorial sections without asking the instructor first**
8. **Unless stated otherwise, assume that all assignments are individual assignments, not group assignments**
9. **Students are NOT allowed to text and take pictures with a cell phone or other devices during the lab.** When photos are needed, ASK THE TEACHING TEAM FIRST!
10. **Follow all UBC guidelines for academic integrity**

**(\*)**: **Valid reasons** are: illness, family emergency or extraordinary circumstances. Heavy workload (due to midterms and assignments in other courses), preparation for MCAT or DAT, etc. are **NOT** considered to be valid reasons. **Please note:** To verify the genuineness of the reason presented to miss a lab, adequate and legible documentation will be required (Note: UBC admin may verify the reason given). Medical notes coming from online MD consultation sites (e.g. MDKonsult Team”) will not be accepted.

## **University Policies:**

*UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence.*

*UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.*

*UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances.*

*UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.*

*Details of the policies and how to access support are available on [the UBC Senate website](#).*