

University of Toronto Scarborough – Department of Biological Sciences  
**BIOB34 – Animal Physiology – Summer 2018**

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**Course Description:** An introduction to the principles of animal physiology rooted in energy usage and cellular physiology. A comparative approach is taken, which identifies both the universal and unique mechanisms present across the animal kingdom. Metabolism, respiration, circulation, water regulation, movement and neural circuits are the areas of principal focus.

**Prerequisites:** BIOA01H3 and BIOA02H3 and CHMA10H3 and CHMA11H3

**Exclusions:** (BIOB30H3), BIO270H, BIO204H

**Recommended Preparation:** MATA29H3

**Lectures:** Wednesdays 7:10-9pm, SW309

**\*\*NOTE:** There will be no lecture on July 11<sup>th</sup>

Lecture notes will be posted (in PowerPoint format only) on Quercus ~24 hours before each lecture. NOTE: I reserve the right to make changes to the lecture notes after they are posted.

Lecture Topics:

- |                            |   |
|----------------------------|---|
| 1 – What are Animals?      | 6 – Feeding & Digestive Physiology      |
| 2 – Metabolic Rate         | 7 – Osmoregulation                      |
| 3 – Thermal Physiology     | 8 – Nitrogen Excretion                  |
| 4 – Respiratory Physiology | 9 – Muscle Physiology (time permitting) |
| 5 – Nervous Physiology     |   |

**Tutorials:** Wednesdays 12:10-1pm, AC223

**Textbook:** There is no required textbook for this course; however, in my experience, many students enjoy having a textbook to supplement their lecture notes. If you so desire, I would recommend the following textbook:

*Animal Physiology*, 4<sup>th</sup> edition, 2016, by R.W. Hill et al.

➔ This book is available at the UTSC Bookstore

I will post suggested readings, where applicable, from this textbook; however, this textbook may discuss material not covered in lecture, and I may discuss material in class not covered by the textbook. *You are only responsible for all material covered in class.*

### **Evaluation:**

Term Tests	35%	(25% best; 10% worst)
“Krogh”-torials	30%	(6 best x 4% for multiple choice tutorials; 1 best x 6% for written tutorials)
Final Exam	35%	

### **Important Notes Regarding Evaluations:**

#### **Term Tests**

There are two Term Tests in this course, which are held outside of class time. The dates and times of the Term Tests will be determined by the Registrar’s office during the first few weeks of the semester, and I will post this information on Quercus as soon as it is available.

Term Tests may cover any material covered in this course, but the lectures emphasized on each Term Test will be announced in class and on Quercus. Term Tests will be 2 hours and will comprise of multiple choice questions only. Students will have choice with regards to which questions they answer (e.g., answer 24 of 30 multiple choice questions). **The Term Test questions will require students to think critically and creatively about the lecture content as students will be expected to explain novel observations and solve problems. This reflects my belief that undergraduate students need to develop not only their scientific knowledge but, more importantly, their competency for thinking, reasoning, and scientific inquiry.**

To help student prepare for Term Tests, optional quizzes (here optional means not worth any marks) will be posted on Quercus each week. *Students are strongly encouraged to discuss these quizzes with the course instructor when they encounter any difficulties, either by email or during office hours (preferred).*

If you know in advance that you cannot write a Term Test at the scheduled time because it conflicts with some other valid activity, please notify the course instructor (or course coordinator) as soon as possible so that arrangements can be made for you to write the Term Test at an alternative time. *Any such alternative time must be before the scheduled date of the Term Test.*

If you miss a Term Test due to medical illness, then you must submit a detailed UTSC Medical Certificate filled out by the physician who saw you on the day of the Term Test. This note must be submitted to the course instructor (or course coordinator) as soon as possible following the Term Test, whether in person or via email. Other medical notes will not be accepted, and if the UTSC Medical Certificate is not completed to the satisfaction of the course instructor, it may be refused. The UTSC Medical Certificate can be found via the following link:

[http://www.uts.utoronto.ca/~registrar/resources/pdf\\_general/UTSCmedicalcertificate.pdf](http://www.uts.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf).

If you miss a Term Test for any other valid reason, please consult with the course instructor (or course coordinator) as soon as possible. The course instructor (or course coordinator) will determine whether the reason given for a missed Term Test is valid in accordance with university policies. Also, the course instructor may ask for any documentation required to verify the reason given.

Students who miss one Term Test for a valid reason (medical or otherwise) will not be permitted to write a make-up Term Test; rather, the weight of their Final Exam will be increased to 45%. (The weight of their remaining Term Test will be 25%).

Students who miss both Term Tests for valid reasons will not be permitted to write make-up Term Tests; rather, the weight of their Final Exam will be increased to 64%, and, in addition, they will be required to complete a second written “Krogh”-torial (worth 6% of their final grade), which will be due no later than the last day of classes (Tuesday, August 7<sup>th</sup> by 11:59pm).

Students who miss a Term Test for any invalid reason will receive a grade of zero for that Term Test.

### **“Krogh”-torials**

These tutorials combine an understanding of the “Krogh Principle” (which you will learn about during tutorial on May 16<sup>th</sup>) with the “flipped exam” model described by Lujan et al. 2014 (and posted on Quercus in case you’re interested).

### **Multiple Choice Tutorials:**

These tutorials will take place on May 23, May 30, Jun 6, Jun 13, Jun 27, Jul 4, Jul 11, and Jul 18. Only the best 6 multiple choice tutorials will count towards a student’s final grade.

Students will be presented with a research problem and a list of five animals. Students will have 25 minutes (the clock will start promptly at 12:10pm!) to decide in which of the five animals the research problem can best be studied (according to the course instructor). In attempting to answer the question, students may consult with any resources available, including other students in the class, online research journals, etc. (Therefore, you may want to have a laptop or phone with you to access the internet.) Students will provide a ranked list of their answers (on a cue card provided), and the marks received on this tutorial will be based on which of their answers is correct. For example, if the student’s first answer is correct, they will receive 100%; if the student’s second answer is correct; they will receive 80%; if the student’s third answer is correct, they will receive

60%; and so on. Since there will always be five possible answers, the lowest mark that a student who participates in any tutorial can receive is 20%. If a student does not submit an answer and/or does not participate in a tutorial, they will receive 0%. Once time expires, the course instructor will indicate the correct answer and how it was derived.

Of course, there is a measure of subjectivity with regards to the Krogh Principle. Therefore, any student who does not rank the correct response as their first answer will be permitted, if they desire, to spend no more than 20 minutes justifying their choice in writing (on one side of another cue card; no more space can be used). If the TA is compelled by the student's argument, they will change the student's grade to 100%. If the TA is not compelled by the student's argument, however, then the student's grade will remain unchanged.

#### Written Tutorials:

These tutorials will take place on Jul 25 and Aug 1. Only the best written tutorial will count towards a student's final grade.

Students will be presented with a research problem. Students will have no more than 45 minutes (the clock will start promptly at 12:10pm!) to write a written argument (on a cue card; both sides can be used, but no additional space) outlining in which one particular animal species (out of > 1 million species) the research problem can best be studied. In attempting to answer the question, students may consult with any resources available, including other students in the class, online research journals, etc.

The answer will be evaluated by the TA and will be assigned a grade of 100% (very compelling answer), 60% (somewhat compelling answer), or 0% (not at all compelling answer).

#### **Final Exam**

The Final Exam will be scheduled by the Registrar's office (August 11-24) and will be worth 35% of the final grade (unless, for reasons stated above, it has a higher weight). It will be 3 hours and will cover all course material, though it will place emphasis on the material discussed since the last Term Test. It will have the same format as the Term Tests.

## Accessibility Needs:

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca).

## Academic Integrity:

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's *Code of Behaviour on Academic Matters* (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

- In papers and assignments:*
- using someone else's ideas or words without appropriate acknowledgement
  - submitting your own work in more than one course without the permission of the instructor
  - making up sources or facts
  - obtaining or providing unauthorized assistance on any assignment.
- On tests and exams:*
- using or possessing unauthorized aids;
  - looking at someone else's answers during an exam or test
  - misrepresenting your identity
- In academic work:*
- falsifying institutional documents or grades
  - falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. There are other offences covered under the Code, but these are the most common. ***Please respect these rules and the values that they protect.***