

University of Toronto Scarborough – Department of Biological Sciences

BIOC34 – Human Physiology II: Lecture – Winter 2016

Course Instructor:

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Office Hours: Mondays 11am-1pm, Wednesdays 1-6pm

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Course Description: This course will cover the physiology of the human respiratory, cardiovascular, renal and digestive systems. Topics include cardiac function, ECG, blood flow/pressure regulation, pulmonary mechanics, gas transfer and transport, the control of breathing, sleep-related breathing disorders, kidney function, ion regulation, water balance, acid-base balance and digestive function/regulation.

Prerequisites: BIOB34H3 or (BIOB30H3) or NROB60H3

Exclusions: BIOC33H3, (BGYC33H3), (BGYC34H3), PSL201Y, PSL301H, (PSL302Y)

Lectures:

Lec01 – Mondays and Wednesdays 10:10-11am in HW216

Lec60 – via Weboption Lecturecasts only

**Lectures will be available via Weboption Lecturecasts for the entire semester for both sections

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

Each week, an *optional* quiz (here *optional* means not worth any marks) will be posted on Blackboard. These quizzes will allow students to i) assess their understanding of the lecture content, ii) think critically and creatively about lecture content, as well as apply lecture content to novel situations and problems, and iii) prepare for the Term Tests and Final Exam. 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).

Textbook:

I do not “teach from a textbook”. There will be no assigned readings from any textbook, and only material covered in class will be subject to examination; 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, which is available in the campus bookstore:

Human Physiology: An Integrated Approach, 7th ed., Silverthorn

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

Computer-Simulated Activities:

In order to complete the required computer-simulated activities for this course, students are required to purchase the following resource, which is available in the campus bookstore:

PhysioEx 9.1: Laboratory Simulations in Physiology, Zhou et al.

Students must complete all of the required computer-simulated activities (see Tentative Schedule) on their own time. ***When completing an activity, students are required only to read the Introduction and complete the Experiment; they are not required to complete any other sections of the activity.***

Evaluation:

Term Tests	35%	(23% best; 12% worst)
Computer-Simulated Activity Assignments	24%	(4 x 6% each)
Computer-Simulated Activity Quizzes	6%	(6 x 1% each)
Final Exam	35%	

Important Notes Regarding Evaluations:

Term Tests

There are two Term Tests in this course. 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 Blackboard as soon as it is available. The Term Tests are not cumulative. The lectures covered on each Term Test will be announced in class and on Blackboard. Term Tests will be 2 hours and will comprise of multiple choice questions only. Students will have some choice with regards to which questions they answer (e.g., answer 20 out of 25 multiple choice questions). **A large proportion (about 70%) of the Term Test questions will require students to think critically**

and creatively about the lecture content as well as apply the lecture content to novel situations and problems. The optional online quizzes will help students to prepare themselves to tackle such questions successfully. Additional office hours (either in-person or online via Blackboard Collaborate) may be made available during the week prior to the Term Tests.

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 me as soon as possible so that we can make arrangements for you to write the Term Test at an alternative time.

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 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.utsc.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 as soon as possible. The course instructor 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 the remaining Term Test will be increased to 35% of their final grade. 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 65% and they will be asked to submit an additional written assignment worth 5%, which will be due no later than the last day of classes. **Under no circumstances will the weight of a missed Term Test be transferred to the Final Exam, so please do not ask.**

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

Computer-Simulated Activity Assignments

Over the course of the semester, students will complete four (**and no more than four**) Computer-Simulated Activity Assignments, one of each of the following types:

- 1) **Report & Explain.** For this assignment, students will present the results of their computer-simulated activity in proper graphical and/or tabular form. They will also describe and interpret their results with text. (Essentially, students are writing a traditional “Results & Discussion” section.) The graphs and tables presented, as well as any references used, should meet the “Guidelines for Manuscript Preparation” from the *Journal of Experimental Biology* (sections 3.3.3, 3.4, 4.1, and 4.2.1), which can be found at <http://jeb.biologists.org/content/manuscript-prep>. Word limit (all text, including table titles and figure legends) = 1250 words.

2) **Reflect & Evaluate.** For this assignment, students will assess the pedagogical value of the computer-simulated activity that they have completed and make recommendations, if deemed necessary, about changes to the activity that they would like to see adopted in a future update of the PhysioEx software. Any recommended changes should be justified by the students and should be sufficiently substantial to justify that the company that manufactures the software would have to release a new version to accommodate the change. Word limit = 750 words.

3) **Plan & Design.** For this assignment, students will outline a new computer-simulated activity that could be added to the PhysioEx software in a future update that complements the computer-simulated activity completed by the student, where “complements” means that the new computer-simulated activity addresses questions that were raised or left unanswered by the current computer-simulated activity. (Essentially, students are writing an “Introduction” and “Experiment” section for a new computer-simulated activity that they envision adding to the PhysioEx software.) Word limit = 1000 words.

4) **Using Instruments & Teaching.** For this assignment, students will create a video tutorial for a Grade 5 teacher who is seeking to perform an experiment in his/her classroom similar to the one performed by the student in the laboratory session. Students should assume that the teacher has limited science training but does have a small budget available for the purchase of equipment. Moreover, students must consider the science learning expectations for Grade 5 Ontario students as outlined in the curriculum, which can be found at <http://www.edu.gov.on.ca/eng/curriculum/elementary/grade5.html>, and incorporate these learning expectations into the video tutorial. The video must be in .mp4 format and cannot be longer than 10 minutes.

Each student can decide for themselves whether to submit an assignment for a given computer-simulated activity, and which type of assignment to submit. **Students must have at least one assignment submitted by January 29th; at least two assignments submitted by February 12th; at least three assignments submitted by March 4th; and all assignments submitted by March 18th.** Late submissions will not be accepted under any circumstances, and if students fail to meet the deadlines above, they will receive a grade of zero. Students may complete these assignments alone or with a partner. *Students can only submit one type of assignment for any particular computer-simulated activity.*

Computer-simulated activity assignments will be evaluated by the teaching assistants as follows:

- a) **Accepted. 10/10.** No feedback from the TAs will be provided, and no further action is required.
- b) **Accepted but Revisions Necessary. 7/10.** In this case, students have two options: i) They can do nothing and keep the grade received, or ii) they can submit a revised copy of the assignment using the feedback provided by the teaching assistant to make their revisions. **Such revised assignments are due within one week of receiving the evaluation from the teaching assistant, and any revisions made must be shown using the Track Changes feature available in most word processing software, where applicable.** If the assignment is accepted, students will receive 10/10; if it is not, students will receive 7/10. **In this latter case, students are not permitted to submit any additional laboratory assignments to try to improve their grade.**

c) **Rejected. 0/10.** In this case, students will be provided with feedback from the teaching assistant, but students will not be permitted to revise their assignment. It will be considered as if no assignment were submitted at all. **Students will, therefore, have the opportunity to submit another assignment in a following week.**

Computer-Simulated Activity Quizzes

For those computer-simulated activities for which a student elects not to submit an assignment, they must instead complete the associated quiz via Blackboard. (NOTE: These quizzes are different than the ones available on PhysioEx itself. Students are not required to complete the quizzes on PhysioEx.) These quizzes will be available throughout the term and can be completed at any time before **Friday, April 1st at 11:59pm**, at which time access to these quizzes will be removed. These quizzes will comprise multiple choice questions about the “equipment” used and the procedures carried out in the computer-simulated activities. They will be timed, and students will have only 10 minutes to complete each quiz. Upon submission, students will receive their mark, but they will not know which questions were completed correctly/incorrectly.

Final Exam

The Final Exam (3 hours) will be scheduled by the Registrar’s office (April 8-22) and will be worth 35% of the final grade. The Final Exam will cover all material covered in the lectures throughout the course, though it will place emphasis on the material covered since the last Term Test. It will have the same format as the Term Tests.

Tentative Schedule:

WEEK	MONDAY LECTURE	WEDNESDAY LECTURE	COMPUTER-SIMULATED ACTIVITY*
Jan 4	Introduction to the Course	Blood	Hematocrit (11.1) & Hemoglobin Determination (11.3)
Jan 11	Cardiovascular Physiology: Heart		Refractory Period of Cardiac Muscle (6.1)
Jan 18	Cardiovascular Physiology: Blood Vessels		Chemical Modifiers (6.4) & Various Ions on Heart Rate (6.5)
Jan 25	Respiratory Physiology: Pulmonary Ventilation		Blood Vessel Radius (5.1) & Blood Viscosity on Blood Flow (5.2)
Feb 1	Respiratory Physiology: Gas Exchange		Blood Vessel Radius (5.5) & Stroke Volume on Pump Activity (5.6)
Feb 8	Respiratory Physiology: Gas Transport		Measuring Respiratory Volumes and Calculating Capacities (7.1) & Comparative Spirometry (7.2)
Feb 15	FAMILY DAY & READING WEEK – NO CLASS		
Feb 22	Respiratory Physiology: Regulation of Breathing		Arteriole Radius (9.1) & Pressure on Glomerular Function (9.2)
Feb 29	Fluid, Electrolyte, and Acid-Base Balance		Reabsorption of Glucose via Carrier Proteins (9.5)
Mar 7	Renal Physiology: Glomerular Filtration	Renal Physiology: Tubular Reabsorption and Secretion	Renal (10.3) & Respiratory (10.4) Responses to Acidosis and Alkalosis
Mar 14	Renal Physiology: Regulation of Urine Concentration and Volume	Renal Physiology: Urine Transport, Storage, and Elimination	Starch (8.1), Pepsin (8.3), and Lipase Digestion (8.4)
Mar 21	Digestive Physiology: Nutrient Digestion and Absorption		THERE ARE ONLY 10 COMPUTER-SIMULATED ACTIVITIES
Mar 28	Digestive Physiology: Endocrine Regulation of Body Mass		
Apr 4	NO CLASS – This is a UTSC Friday	NO CLASS – Classes end Apr 4	

*This is merely a list of all the computer-simulated activities that students must complete during the semester. Students need not complete the activities in this particular order or during the particular weeks indicated. When two or more activities are listed together, they should be considered as one activity for the purpose of this course.

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 SW302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or 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.***