Department of Biology Course Outline

Summer, 2025, BIOL3070, Animal Physiology II, 4.0 credits

Course Instructor: Jinghan Tan

How to address me: Jinghan

Personal Pronouns: (she/her)

Email: jhtane@yorku.ca

Note: If you have or question or would like to talk with me, you can send an email, visit me during student hours (see below), or approach me after class.

Student Hours: Friday, 2:00-3:00pm

What are 'Student Hours'?

Student hours are dedicated times through the week for the course instructor to meet with YOU. Pop in to introduce yourself, ask questions about the course, or discuss content from the course.

Note: If these times don't work for you, email me and we can arrange an alternate time to meet.

Course Format: All lectures & labs are held in-person. PDF of lecture slides are posted on eClass in advance. Students are welcome to take audio recordings of lectures for personal use.

Prerequisites: SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, and SC/BIOL 2030 4.00.

Office Location: Lumbers 221

Click here for visual directions.

Class Times: Monday, Wednesday & Friday, 1:00pm – 1:50 pm

Class Location: Life Science Building (LSB) 105

Click here for visual directions

Laboratory Times: Monday & Wednesday @ 2:30 pm – 5:30 pm

Laboratory Locations: Lumbers 110

Click here for visual directions.

Study Spaces on Campus: https://currentstudents.yorku.ca/study-spaces

Laboratory coordinator:

Jinghan Tan (jhtane@yorku.ca)

Laboratory TAs:

Samuel Holm (samuelholm93@gmail.com)

Christian Barakat (chrisbarakat8@gmail.com)

Course Outline Table of Contents:

Land Acknowledgement

York University recognizes that many Indigenous Nations have longstanding relationships with the territories upon which York University campuses are located that precede the establishment of York University. York University acknowledges its presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit, and Métis communities. We acknowledge the current treaty holders, the Mississaugas of the Credit First Nation. This territory is subject of the Dish with One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.

Welcome to this Course!

This course employs a comparative approach to studying various physiological processes in animals. Specifically, the physiology of digestion, osmoregulation, excretion, circulation, gaseous exchange, metabolism, reproduction and growth will be covered in this course. First, the basic principles underlying the specific physiological activities will be explained and then the means by which different organisms perform them will be examined. The laboratory component will provide an opportunity for students to conduct representative experiments from most of the organ systems covered in the lecture. Upon completion, students are expected to have a solid understanding of how selected physiological processes take place in animals, and to have practiced and developed their scientific writing through data collection, analysis, presentation, and interpretation of laboratory results. Carry out biological laboratory activities, in-person, with safety and reliability in a laboratory setting.

Course Calendar Description: The processes of digestion, osmoregulation and excretion, circulatory systems and gaseous exchange, metabolism, growth and reproduction are considered. The course adopts a comparative approach, first analyzing the basic principles underlying physiological activities, then examining the means whereby different organisms perform them.

Course level learning objectives

Upon successful completion of this course, students should be able to:

1. Evaluate how physiological systems work independently and collectively with each other.
2. Compare the strategies and physiological adaptations used by different animals and the influence of varying environmental conditions that enable animals to live within a diverse range of habitats.
3. Evaluate the biological problems of animals comparatively from a physiological viewpoint.
4. Analyse the effects of internal and external stimuli on the physiological functions of cells/tissues/organs.

Course Content:

Blood and Circulatory System

- Anatomy of the circulatory system
- Blood cells
- Heart
- Hemodynamics and peripheral circulation
- Regulation of circulation

Gas exchange
- Gas properties
- Transport of O2 and CO2 in the blood
- Gas exchange in air and in water

Iono- and Osmoregulation
- Body fluid composition and exchange of ions and water
- Osmoregulation in aquatic environments
- Osmoregulation in terrestrial environments
- Excretion

Acid/Base Balance
- CO2 transport and acid/base balance
- Ventilation and acid/base balance
- Excretion and acid/base balance

Feeding, Digestion and Absorption
- Food and feeding
- Alimentary system, gut motility and GI secretion
- Digestion, absorption and excretion

Metabolism
- Metabolic pathways
- Metabolic rate
- Regulation of metabolism

Thermoregulation
- Heat and body temperature
- Thermal regulation in ectotherms
- Thermal regulation in endotherms

Growth
- Body growth (including long bone growth)
- Regulation of postnatal growth

Reproduction
- Reproductive strategies
- Sexual determination, differentiation and maturation
- Male and female reproductive physiology
- Gametogenesis and Fertilization

Inclusive teaching statement:

All students in the class, the instructor, and any guests should be treated with respect during all interactions. I am committed to fostering an environment for learning that is inclusive for everyone. It is my hope that our class will support diversity of experience, thought, and perspective. I will continually strive to create inclusive learning environments and would therefore appreciate your support and feedback. I attempt to create a respectful, inclusive learning environment in class where everyone is welcome to ask questions and discuss what is being presented. Through review questions and frequent encouragement of in-class participation, I attempt to make sure all students understand the material on physiological processes before continuing onto other topics. I offer multiple opportunities to seek further clarification including (but not limited to): questions during and after class, review sessions before term tests and weekly scheduled office hours. If this time doesn't work for you due to a scheduling conflict, email me (jhtane@yorku.ca) to make arrangements for another meeting date/time (in person or on Zoom). Since the course material is extensive, I provide lecture slides (in PDF format) on eClass prior to class so that there is ample time for students to preview the upcoming lecture material and to write notes on slides while attending lectures in-person.

Community Guidelines

The following values are fundamental to academic integrity and are adapted from the International Center for Academic Integrity*. In our course, we will seek to behave with these values in mind.

	As students, we will...	As a teaching team, we will...
Honesty	• Honestly demonstrate our knowledge and abilities on assignments and exams • Communicate openly without using deception, including citing appropriate sources	• Provide honest feedback on your demonstration of knowledge and abilities on assignments and exams • Communicate openly and honestly about the expectations and standards of the course via the syllabus, and with respect to assignments and exams
Responsibility	• Complete assignments on time and in full preparation for class • Show up to class on time, and be mentally/physically present • Participate fully and contribute to team learning and activities	• Provide timely feedback on your assignments and exams • Show up to class on time, and be mentally and physically present • Create relevant assessments and class activities
Respect	• Speak openly with one another, while respecting diverse viewpoints and perspectives • Provide sufficient space for others to voice their ideas	• Respect your perspectives even while we challenge you to think more deeply and critically • Help facilitate respectful exchange of ideas
Fairness	• Contribute fully and equally to collaborative work, so that we are not freeloading off others • Not seek unfair advantage over fellow students in the course	• Create fair assignments and exams, and grade them in a fair, and timely manner • Treat all students equitably
Trust	• Not engage in personal affairs while on class time • Be open and transparent about what we are doing in class • Not distribute course materials to others without authorization	• Be available to all students when we say we will be • Follow through on our promises • Not modify the expectations or standards without communicating with everyone in the course
Courage	• Say or do something when we see actions that undermine any of the above values • Accept a lower or failing grade or other consequences of upholding and protecting the above values	• Say or do something when we see actions that undermine any of the above values • Accept the consequences (e.g., lower teaching evaluations) of upholding and protecting the above values

[2] This class statement of values is adapted from Tricia Bertram Gallant, Ph.D.

Learning Materials

Textbook (not required, but recommended):

Animal Physiology: From Genes to Organisms, 2nd edition

Sherwood L., Klandorf H., Yancy P.H., 2013, Brooks/Cole, Cengage Learning

Lab Manual: All lab manuals will be posted on eClass.

Website (eClass): https://eclass.yorku.ca/course/view.php?id=132151

Technology Checklist:

 An internet-enabled computer to access eClass and materials	 Zoom software installed on computer	 Access to reliable internet	 Webcam	 Microphone

Note: *If you don't have access to a computer, webcam, microphone, consider borrowing a laptop from York U, financial aid from York, and single workspaces available for student use on campus at the library. (https://www.library.yorku.ca/web/ask-services/printing-and-computing/computing/public-computers-labs/)*

Assessment in this Course

Research about learning strongly suggests that the most important factor in learning is doing the work of reading, writing, recalling, practicing, synthesizing, and analyzing. Learning happens best when people actively engage material on a consistent basis, and that is why we have high standards in this course. We are confident that, with appropriate effort, you **all** can meet those standards.

When possible, we also try to reduce unintentional bias in grading by, for example, grading assignments one question at a time (grading all of question 1 before grading any of question 2), grading anonymously, and using rubrics. These also help improve consistency in marking.

Grade Breakdown*

COMPONENT	GRADE VALUE
TERM TESTS (X3)	60%
LAB REPORTS (X4)	32%
LAB ASSIGNMENTS (X4)	4%
LAB QUIZZES (X8)	4%

*Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles at the discretion of the course director.

Lab Quizzes

There are eight (8) labs in this course and each has a short pre-lab quiz each worth 0.5% of your final grade. The quizzes will be multiple choice, true or false, and fill in the blank. Quizzes are completed in advance on eClass.

Lab Assignments

Labs that do not require a lab report (lab# 1, 3, 5 & 7) will include a short assignment that must be completed in-lab and submitted before you leave. Essentially, participating and following the directions of your lab demonstrator will permit you to easily complete these assignments. There are four (4) short lab assignments in this course and the specific requirements will be communicated by your lab demonstrator. Lab assignments cannot be submitted late (no exceptions).

Lab Reports

Reports are required for four (4) laboratories – the first, second, third and fourth lab reports will be worth 6, 7, 9 and 10%, respectively. Labs with formal lab reports (lab# 2, 4, 6 & 8) require you to attend the lab to participate and collect your own data in order prepare and to submit the lab report. **Lab reports have a two-week deadline (no extensions) and are due at the beginning of your lab period**! Students are encouraged to refer to the comprehensive document posted on eClass outlining requirements for the lab reports and request clarification by contacting the TA (Lab demonstrator) and TA coordinator (jhtane@yorku.ca).

Late policy: Lab reports have a generous two-week submission deadline. After that time, **10%** will be deducted per day including weekends and holidays. If you submit the report after your lab has started (2:30pm), it is considered late. In the event you are having trouble with the Turnitin submission link on eClass, you must immediately email the report to your TA and copy the lab coordinator (**before the deadline**).

Midterm Exams

All three midterms will be in-person and will be based exclusively on lecture and lab material when relevant overlap in content occurs. They are **designed to take 40 minutes** each, but you will have the full 50-minute class period to complete them. The midterms will consist of multiple choice and short- and long-answer questions like the ones we complete as practice in class or during review sessions.

- **Missed midterm policy:** If you miss a midterm due to an unpredicted reason, you do not need to bring physician's documentation. Please email me (jhtane@yorku.ca) as soon as possible (no later than 48 hrs after the missed term test). **Students who miss up to one term test will be permitted to write an equivalent make-up exam (that covers the same material as the**

test that was missed) during the official exam period (August 7-14, 2025) at the discretion of the course director.

MIDTERM	GRADE VALUE	LECTURE TOPICS	LAB TOPICS	DATE
1	*15-25%	Circulation; Gas Exchange	Labs 1-3	Jun. 6th, 2025
2	*15-25%	Iono- and Osmoregulation; Acid/Base Balance; Feeding, Digestion & Absorption	Labs 4-6	Jul. 11th, 2025
3	*15-25%	Metabolism; Thermoregulation; Growth; Reproduction	Labs 7-8	Aug. 4th, 2025

* The three midterms are worth a total of 60%; however, to help students achieve the highest final grade, term tests are not equally weighted. Specifically, the lowest, median and highest test grades will be worth 15%, 20% and 25%, respectively.

Final Exam

If you complete all three term tests during the term, there is no final exam. The final exam date is **only** for students who miss up to one of the term tests. Any student who misses more than one term test will need to submit an official petition through their home faculty. The final exam will take place during the Final Exam period and will be scheduled by the Registrar's Office.

- **Missed final exam policy:** If you miss the final exam due to an unpredicted reason, you must email the course director at jhtane@yorku.ca within two (2 days) of the final exam and complete (and submit by email) a Deferred Standing Agreement (DSA) form, which also requires an Attending Physician's Statement (effective January 1, 2025).

Regrading/Reappraisal Procedures

Please note for all regrading requests, the full assignment or test is reviewed/regraded which may result in a lower grade. We will strive to review all re-grading requests within 3 weeks.

1. For all **term test re-grading requests**, please submit your request via email (jhtane@yorku.ca). Include your (1) Your Name and Student Number, (2) A summary of the request (e.g., the total was miscounted), and (3) drop off the test to be re-graded (to Lumbers 221).
2. For all **lab report re-grading requests**, please submit your request via email (jhtane@yorku.ca). Include your (1) Your Name and Student Number, (2) A summary of the request (e.g., the total was miscounted), and (3) an e-copy of your graded/submitted lab report.

University Policies

Important Dates

Drop Deadline: July 7th, 2025 (last day to drop without receiving a grade on transcript)

Course Withdrawal Deadline: July 8th-August 5th, 2025 (withdraw from a course and receive a grade of "W" on transcript)

Grading Scheme

In accordance with the York University Undergraduate Calendar Regulations, the letter grades assigned in undergraduate courses at York conform to the descriptions and grade ranges shown here: https://calendars.students.yorku.ca/2022-2023/grades-and-grading-schemes

Academic Honesty and Integrity

Academic misconduct undermines the values of honesty, trust, respect, fairness, and responsibility that we expect in this class. York University provides supports such as academic integrity workshops to ensure that all students understand the norms and standards of academic integrity that we expect you to uphold.

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Academic Conduct Policy and Procedures (https://www.yorku.ca/secretariat/policies/policies/academic-conduct-policy-and-procedures/). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards. Please review and familiarize yourself with the policy.

BIOL3070 Course Policy: No Use of AI-Based Tools

The use of generative AI tools in the preparation or completion of assignments (lab reports, lab assignments, quizzes, etc.), term tests, exams, or any other form of assessment is not permitted in this course. Using such tools for any part of an assessment may be treated as a case of academic misconduct as outlined in York University's Senate Policy on Academic Conduct.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve your research and writing skills, and cope with university life. Students are expected to review the materials on the Academic Integrity website:

Examples of actions that do not adhere to York's Academic Integrity Policy include:

- Plagiarism (passing off someone else's work as your own)
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams
- Uploading work to third party repository sites (e.g., Course Hero, One Class, etc.)
- Scanning, sharing, uploading, or publishing exams, tests, or scholarly work

For more information on what academic integrity is and why it is important see: https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/. Information on the process of investigations into breaches of academic honesty: https://spark.library.yorku.ca/academic-integrity-breach-of-policy-on-academic-honesty/

Important Note from the FSc Committee on Examinations & Academic Standards (CEAS): Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g., Course Hero, One Class, etc.) were taken and used by unknown students in later offerings of the course. Whenever a student submits work obtained through an external site (e.g., Course Hero, Chegg), the **submitting student will be charged with plagiarism** and the **uploading student will be charged with aiding and abetting**. To avoid this risk, students are urged not to upload their work to these sites.

Assistance for Students (Academic and Well-Being)

Academic Advising*: https://www.yorku.ca/science/academic-advising/ * Departments also offer program-specific advising. Check with your Department's Undergraduate Office.

Centre for Human Rights, Equity, and Inclusion: https://rights.info.yorku.ca

Centre for Indigenous Students Services: https://aboriginal.info.yorku.ca/

Food Access, Funding, & Supports/Resources: https://students.yorku.ca/food

Good2Talk 24-hour Ontario Student Helpline: 1-866-925-5454 /Text: GOOD2TALKON to 686868

Keep.meSAFE: https://myssp.app/keepmesafe/ca/home

Learning Commons (general academic learning supports including library research, time management, study skills, career planning, etc.): https://learningcommons.yorku.ca/

Peer Assisted Study Sessions (PASS): https://www.yorku.ca/colleges/bethune/get-help/pass/

Peer Tutoring: https://www.yorku.ca/colleges/bethune/help/tutoring/

Sexual Violence Response and Support: https://thecentre.yorku.ca

Student Counselling, Health & Well-being: https://counselling.students.yorku.ca/

Support Services for International Students: https://yorkinternational.yorku.ca/international-student-support/

Writing Services: https://www.yorku.ca/colleges/bethune/get-help/writing/

York University Student Services: https://family.yorku.ca/student-services/#SCD

York University Student Well-being Resources: https://www.yorku.ca/well-being/resources/students/

Accessibility

York University is committed to principles of respect, inclusion, and equality of all persons with accessibility needs across campus. The University provides services for students with accessibility needs (including physical, medical, learning, and psychiatric needs) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

If you are in need of these services, please register with accessibility services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with accessibility services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Student Accessibility Services: https://accessibility.students.yorku.ca

York Accessibility Hub: http://accessibilityhub.info.yorku.ca/

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course Director immediately. To arrange an alternative date or time for an examination scheduled in the formal examination periods (August 7-14), students must complete and submit an accommodation request form at least 3 weeks *before the exam period begins*. https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.pdf

Student and Instructor Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/.

Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University.

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:

https://calendars.students.yorku.ca/policies-and-regulations

Course Overview and Schedule

May 2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
			1	2	3/4
5 Course start date Lecture 1: Introduction	6	7 Lecture 2: Circulation	8	9 Lecture 3: Circulation	10/11
12 Lecture 4: Circulation	13	14 Lecture 5: Circulation	15	16 Lecture 6: Circulation	17/18
	Lab 1 (week of May 12): Hemodynamics and Peripheral Circulation				
19 Holiday: No class	20	21 Lecture 7: Gas exchange	22	23 Lecture 8: Gas exchange	24/25
26 Lecture 9: Gas exchange	27	28 Lecture 10: Gas exchange	29	30 Lecture 11: Gas exchange	31
	Lab 2 (week of May 26): Oxygen Consumption (1st lab report)				

June 2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
					/1
2 Lecture 12: Gas exchange	3	4 Lecture 13: Iono- & Osmoregulation	5	6 Term test #1	7/8
	Lab 3 (week of June 2): Carbonic Anhydrase				
9 Lecture 14: Iono- & Osmoregulation	10	11 Lecture 15: Iono- & Osmoregulation	12	13 Lecture 16: Iono- & Osmoregulation	14/15
	Lab 4 (week of June 9): Water Balance (2nd lab report) 1st Lab report Due				
16	17 Summer break	18	19	20 Summer break	21/22
23 Lecture 17: Iono- & Osmoregulation	24	25 Lecture18: Acid/Base balance	26	27 Lecture 19: Feeding, Digestion and absorption	28/29
		Lab 5 (week of June 23): Digestion 2nd Lab report Due			
30 Lecture 20: Feeding, Digestion and absorption					

July 2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
	1	2 Lecture 21: Feeding, Digestion and absorption	3	4 Lecture 22: Feeding, Digestion and absorption	5/6
7 Lecture 23: Metabolism	8	9 Review Session	10	11 Term test #2	12/13
	Lab 6 (week of July 7): Glucose Homeostasis (3rd lab report)				
14 Lecture 24: Metabolism	15	16 Lecture 25: Metabolism	17	18 Lecture 26: Thermoregulation	19/20
	Lab 7 (week of July 14): Scaling of Long Bones				
21 Lecture 27: Thermoregulation	22	23 Lecture 28: Reproduction	24	25 Lecture 29: Reproduction	26/27
	Lab 8 (week of July 21): Reproduction Physiology 4th lab report) 3rd Lab report Due				
28 Lecture 30: Reproduction	29	30 Lecture 31: Growth	31		

August 2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
				1 Review Session	2/3
4 Term test #3	5 Course end date	6	7 Final Examinations	8	9/10
(week of Aug. 4): 4th Lab report Due					
11	12	13	14 Final Examinations	15	16/17
18	19	20	21	22	23/24
25	26	27	28	29	30/31