

Bio 3601A: Animal Physiology Course outline

1. Course Information

Course Information

3601A: Animal Physiology, Fall 2022,

Class: Mon-Wed-Fri, 10:30-11:30 AM;

Tutorials: One of Tues 9.30-11.30 AM; Tues 1.30-3.30 PM; Weds 2.30-4.30PM; Thurs 9.30-11.30AM.

Note: Tutorials will not be held every week. Watch OWL for details.

List of Prerequisites

A minimum mark of 60% in Biology 2601A/B.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors	Email	Office	Phone	Zoom Office Hours
Dr. Natasha Mhatre	nmhatre@uwo.ca	BGS 3023	X 84505	M: 4-5 PM Or by appointment
TA: Reese Gartly	rgartly@uwo.ca	BGS 3027	-NA-	-NA-
TA: Stefane Sarhashi	ssarushash@uwo.ca	-NA-	-NA-	-NA-

Contacting the instructor

I encourage you to come to me with questions and/or comments, or to discuss biology in general. This can often be done during **Zoom office hours** or by setting up a **Zoom appointment**. You must use your uwo.ca or ivey.ca accounts to access the Zoom office hours.

If you would prefer a scheduled meeting, or my office hours do not fit your timetable, please email to arrange a mutually convenient time. Please bear in mind that I run a lab. I have students and post-doctoral fellows, so appointments may only be available with 1-2 weeks' notice.

Please include "Bio 3601a" in the subject lines of any emails. For your own protection, **please only send emails from your uwo account** – I will delete emails about the course from non-uwo addresses, as well as emails that are impolite or written in the manner of a text message. As with all

communication in the adult world, please begin your emails with a salutation (“Dear Dr. Mhatre”) and end with some identifier of who you are (“Abigail P. Student”). I will not usually respond to e-mails received on weekends, holidays or outside normal working hours, but will answer them as soon as possible on the next business day.

All course material will be posted to OWL: <http://owl.uwo.ca>. Any changes will be indicated on the OWL site and discussed with the class.

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Google Chrome or Mozilla Firefox are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

Professionalism & Privacy:

Western students are expected to follow the Student Code of Conduct. Additionally, the following expectations and professional conduct apply to this course:

- Students are expected to follow online etiquette expectations provided on OWL
- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed, sold or shared,
- All recorded sessions will remain within the course site or unlisted if streamed

3. Course Syllabus, Evaluation, Delivery Mode

Course summary and learning outcomes:

This course will cover a variety of topics, including allometry, ion and water balance, neurophysiology, endocrinology, thermal biology and physiological responses to human environmental impacts. The goal is to understand how animals survive and thrive in a range of extraordinary terrestrial and aquatic environments.

Content will be covered through

1. student-directed learning based on textbook chapters and online quizzes
2. lectures covering specific areas of interest for each topic,
3. lectures based on experimental design and evaluation,
4. in-class exercises that focus on integrating and applying knowledge from the lectures and readings.
5. & will be complemented by tutorials which will focus on the analysis and interpretation of existing datasets.

Together, this approach will allow students to address integrative-applied problems, associated primarily with the lecture material, in the exams.

Learning outcomes:

By the end of this course, students will be able to

- 1) Distinguish physiological strategies and mechanisms, and compare and contrast some of the strategies and mechanisms animals use to maintain ion and water balance, survive extreme temperatures, sense and respond to their environment, and coordinate physiological processes throughout the body.
- 2) Explain how physiological measurements can inform conclusions about the impacts of humans on animals in nature.
- 3) Analyse a basic dataset in a physiological context, and write a succinct and accurate conclusion based upon those data.
- 4) Apply basic physiological principles to critically evaluate an existing dataset.
- 5) Read a scientific paper in the general field of comparative animal physiology and critically evaluate the experimental design, methods, and data.
- 6) Design an experiment or experiments to address a physiological question that students have not previously encountered, and clearly articulate that experiment in writing.

Please note that the focus of this course is on comparative animal physiology, and we will not cover biomedical or disease-model physiology. Courses on those topics are available through the basic medical sciences.

Course requirements

Please see the Western University Academic Calendar for pre- and anti-requisites. Students are responsible for ensuring they are qualified to be enrolled in this course. You are required to attend all lectures and your assigned tutorials (there are penalties for missing the latter), and to manage your time to allow you to read textbook chapters and complete quizzes by the deadlines.

In this course, I assume that you have passed Biology 2601a with a clear understanding (and memory!) of the material therein. You may have to revisit your notes (or additional textbook chapters) to keep up with the material in this course.

Course delivery- in person and over Zoom

- This course will be primarily in-person, with some components also available online.
- There will be three in-person in-class tests which **are mandatory and cannot** be attended via Zoom.
- In the event we need to move online, we will use Zoom for previously in person components and Gradescope for in class tests.
- Western rules for being in a classroom or in a tutorial include a mask mandate and a vaccine booster

Lectures: Lectures online & Discussions in person

- Lectures will be held in class, in person and can be attended via Zoom.
- Recorded lectures from previous years or updated versions will also be released as a courtesy.
- Where possible they will be available on the previous Monday, Wednesday and Friday at 9AM.

- For example, the lecture released on Monday Sept 13th will be discussed in class on Wednesday Sept 15th;
- 2nd example, the lecture released on Friday Sept 17th, will be discussed on Monday Sept 20th.

Tutorials: intro online & tutorial in person

- The Tutorials are mandatory. See below for absence policies.
- These will be similar to the lectures.
- The introductory talk will be pre-recorded and available on OWL.
- The actual tutorial will be in person, but can be attended via Zoom.
- Each tutorial is worth 3%, and the assessments for it can all be completed online.

Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, with the synchronous bits staying synchronous using our existing Zoom links (i.e., at the times indicated in the timetable) and the asynchronous bits remaining synchronous (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

Evaluation:

Item	Value	Due dates
4 Reading based quizzes (Asynchronous OWL Quiz, Timed: 120 mins)	36% (9% each)	26 th September 2022, 5 PM 17 th October 2022, 5PM 7 th November 2022, 5PM 18 th November 2022, 5 PM
3 Lecture based tests (Each section; Synchronous, In person , Timed: 40 mins)	23% (5%, 9%, 9%)	28 th September 2022 26 th October 2022 21 st November 2022
5 Tutorials (In person tutorials. Asynchronous, untimed assignments)	15% (3% each)	19 th September 2022, 5 PM 3 rd October 2022, 5 PM 17 th October 2022, 5 PM 7 th November 2022, 5PM 14 th November 2022, 5PM
Final exam (In person, timed, 120 mins)	26%	Scheduled by the University

To pass this course, you must get at least 50% (25.5/51) for the quizzes + tutorials, and at least 50 % (24.5/49) in the tests + final exam. If you need accommodations for the exams they will be made available.

Attendance of the tutorials is mandatory, and you will not receive any marks for the in-class portion of the tutorial if you miss the tutorial without appropriate documentation or prior permission.

There will be no late submissions for the online quizzes. You are strongly advised to attempt the reading-based quizzes well before the deadlines to guard against computer failures or unexpected mishaps.

There will be no make-ups for the lecture-based tests. If you miss a test with appropriate documentation, your mark will be reweighted based on your performance on the other lecture-based tests and the final.

Course material:

This course will make extensive use of

Hill, R.W., Cavanaugh, D.J. & Anderson, M. (2021) *Animal Physiology*. 5th Edition. Sinauer, Sunderland, MA.

Note that this is new edition of the text you used in Biology 2601, so you may already own a copy. The text is available from the bookstore in hardcover (expensive!) and in pre-punched looseleaf (cheaper) and a digital copy (cheapest) is also available. If you decide you like the text after purchasing the looseleaf version, you could probably get it bound on campus by graphic services. You may also be able to find better deals on the interwebs, or there may be an e-book available, too. The library may also have physical reserve copies available this Fall.

You are welcome to use the 4th edition of the text (or another animal physiology textbook), which you may already own or be able to buy second hand ... however, if you choose to do so, you are responsible for figuring out what the readings are, and also to appraise yourself of any material that differs between editions. I have a few copies of the 4th edition that I am happy to lend to students who need them. Please return them at the end of the year, for next years students.

Readings and online quizzes:

Animal physiology is a very broad field. At the 3000-level, you are expected to begin to develop both a breadth and depth of knowledge – much more so than can be covered in lectures (or studied for an exam!). For this reason, the breadth of knowledge in the topics covered in this class will come from self-directed learning (reading the textbook – and probably taking notes as well!). Your broad knowledge of this material will be assessed through online quizzes; although the material itself will not be tested directly in the exams, I will assume that it provides appropriate background for following the lectures and reading the research articles happening in that week. Thus, the material covered in the readings is implicitly required for much of the rest of the course. Doing the readings and the quizzes will help you to keep up with the lectures, and to allow you to make the most of lectures and tutorials. On the other hand, falling behind on the reading, will make the lectures and tutorials harder.

Your uptake of the readings will be assessed in four online quizzes, each worth 9% of your final grade. If you get more than 80% in the quiz, you will receive the full 9%. If you get less than 80%, you will receive a proportion of the 9% equivalent to your grade in the quiz. Each quiz will have 30-50

questions, and will be available on OWL. 120 minutes will be available for each quiz attempt, so you might like to think of it as an open-book exam. In many ways, this mirrors the real-life way researchers and scientists use textbooks, so it's a good habit to develop. A useful suggestion for finding information is to always keep track of the headers within the chapter in your initial readings and notes, since headers are a way of analytically organising information and making it more manageable. You can take the quiz up to three times, and your highest grade will be logged.

Please note that the deadline for the quiz is firm. This means that if you miss the deadline without appropriate documentation covering the whole week prior to the deadline, then you will not get any marks for that quiz. I therefore suggest that you leave a lot of time to attempt the quiz, and do it earlier, rather than later. Technology-failure excuses such as "my internet connection died at the last moment", or unjustifiably last-minute excuses ("I got sick an hour before the deadline" ... it's a 120 min test!) are not acceptable, so avoid exposing yourself to that risk.

Chapters for quizzes

(from Hill, R.W., Cavanaugh, D.J. & Anderson, M. (2021) *Animal Physiology*. 5th Edition.)

Quiz 1: Ion and Water Balance: 5, 27, 28, 29, pp682-685

Quiz 2: Neurophysiology: 12-15, 19

Quiz 3: Endocrinology: 16-17

Quiz4: Thermal Biology: 10-11

Lectures:

The lectures in this course serve three purposes:

1. To provide the depth to match the breadth of material covered in the readings and quizzes
2. To introduce you to the process of carefully and critically reading and interpreting the primary literature
3. To provide a forum to practice thinking about the design and interpretation of experiments – highly relevant to your performance in both the tutorials and the exam.

Much of the material in these lectures will come directly from the primary literature – both up-to-the-minute journal articles and older classics. Basically, the lectures will serve as a series of case studies, and the coverage in the lectures is intended to allow you to understand these case studies. Hopefully, through this mechanism, you will also get a feeling for how one examines science critically, as well as how the information covered in textbooks is generated, and will prepare you to solve your own new scientific problems. This will also help you to solve the scientific problems posed in the exam (well – the questions will be based on things we've already discussed anyway!). In addition, the skill of reading and interpreting scientific literature will be helpful in other courses, in life as a researcher/ physician/ astronaut/ lawyer/ [insert career goal here] and as an informed citizen participating in society.

Attending lectures is **highly recommended**, since the exams will reflect the emphasis of the lectures (not always apparent from the posted Power-point files), and the material in the lectures is not necessarily covered in the textbook. Pre-recorded lectures and their respective Power-point files will be available to you over OWL, but I recommend attending if you are well enough to. I will populate the weeks in the Course Content tab as we go through the semester. Indeed, the pre-test discussions and the last two weeks of the course will focus entirely on questions that will be extraordinarily important to the questions you will tackle in the final exam!

Tutorials:

There are five scheduled tutorial sessions for this course. In each of them, you will work your way through a dataset, practicing analysing and interpreting data, and using your knowledge from lectures and readings to draw biological conclusions. This will achieve two goals:

1. You will gain experience working with a variety of different datasets in a way that integrates your knowledge from other parts of the course.
2. You will get practice describing biological conclusions in a clear, concise manner.

In preparation for the tutorials, please bring a hard copy of the tutorial worksheet that you can fill out and hand in at the end of the tutorial. You may find it helpful to bring your class notes and textbook.

Each tutorial is worth 3% in total. 1% of your mark will come from filling out the worksheet in class. The other 2% will come from a short (paragraph) answer you will submit via OWL – you can complete this in class, or by on the scheduled day of the deadline. Note that this deadline is closer if you have a tutorial later in the week, but that this should not matter, because you should be able to complete and submit your answer during your tutorial session.

Turnitin.com Note that in this course I will require you to submit your tutorial answers to turnitin.com. In the unlikely event that you haven't come across it yet, turnitin.com is an anti-plagiarism tool that checks the text of your submission against the work of your classmates, the turnitin.com database (previous assignments submitted to turnitin.com) and **the entire internet**. This means that if you copy things from the internet (or from other students), you will be caught. Please be aware that turnitin.com is clever enough to detect plagiarism where a few words are changed in an attempt to make the passage 'different'.

And for the legalese:

Tutorial assignments will be subject to submission to turnitin.com for textual similarity review by the commercial plagiarism software under license to the University. All documents submitted to the turnitin.com system will be included as source documents in the reference database for the purpose of detecting plagiarism in documents subsequently submitted to the system. Use of this service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Submitting Tutorials:

- Submitting your tutorial text will automatically upload it to turnitin.com.
- Note that by submitting the assignment, you are agreeing to the terms and conditions of turnitin.com (as negotiated by Western University), and also confirming that this copy is identical to that uploaded to turnitin.com.

Lecture based tests:

There will be three tests in this course, which will occur during class time, in the room assigned for the course. The tests will be 40 minutes long. The first of these tests is worth 5% of your final mark, the following two are worth 9%.

The tests will consist of short answer questions, and some integrative questions (The number of integrative questions will increase later in the course). There will be some choice in which questions to answer, and each test will examine only that section of the course that immediately precedes them. It will be obvious from the names of the tests, which section the test will cover. Expect these tests to be considerably more challenging than the online quizzes. The nature of the questions in these tests will differ considerably from the content-focused nature of the online quizzes, so do not assume that because you aced the quizzes with ease that you will find the exam and tests similarly straightforward. Do view the pre-test discussion lectures which aim to prepare you for these tests and use Zoom office hours to ask questions if something is unclear! It what they are there for! There will also be Forum links for questions.

For the test, you are allowed to bring reference material. **However, this will consist of only a single letter-sized piece of paper.** Your notes must be handwritten, and you may use both sides. I reserve the right to inspect these documents. If you bring a document to the test that violates the rules, it will be confiscated and shredded.

If you are a student with a disability and require extra time accommodation, please ensure your accommodations are active on the Accommodated Exams website <https://studentservices.uwo.ca/Accommodatedexamssignup/> for this course 10 days before the assessment.

The marks for the tests will be posted on OWL. The tests themselves will be available for pick-up during Dr. Mhatre's office hours.

Lecture based final exam:

The cumulative final exam is worth 26% of the course. The exam will be based on the emphasis of material covered in the lectures (including the scientific papers), and will require you to integrate information and skills from all aspects of the course (however, you should concentrate your focus on the lecture material when studying). The exam will consist of short and paragraph answer questions, and will include quite a lot of choice, so don't be too overwhelmed by the breadth of material in the course. However, the final will be difficult, because it will emphasize 'application' type questions. You should be well-prepared for this by the in-class discussion, tests and the integrative exercises in the last couple of weeks of class. The final exam like the tests will differ considerably from the content-focused nature of the online quizzes, so do not assume that because you aced the quizzes with ease that you will find the exam straightforward.

For the final exam also, you are allowed to bring reference material. **However, this will consist of only a single letter-sized piece of paper.** Your notes must be handwritten, and you may use both sides. I reserve the right to inspect these documents. If you bring a document to the test that violates the rules, it will be confiscated and shredded.

Missing a deadline, quiz, test, exam, or assignment because of illness or other circumstances:

If you have a valid reason to miss a quiz or a lecture test deadline, please take appropriate documentation to your Dean's office. The counselor will contact me directly.

Note that because you should be attempting the reading based quiz well in advance, and your medical issue should cover the week before the deadline. Once you have taken your documentation to the Dean's office, please also inform me (by email is fine), and we can talk about how to accommodate your absence. Note that you are not required to provide any details of the reason for your absences to me (this is assessed confidentially in the Dean's office), but that the agreed-upon accommodation will not be valid if I do not hear from the Dean's counselor, and that in some cases, giving me some clues about when you will again be fully functional will help me to provide reasonable accommodation.

Being 'very busy' is not a good excuse. We are all busy, and for this reason I've set up all the deadlines in this course well in advance. And I develop a very detailed course website and calendar to ensure you always have your eye on the deadlines. Do try and manage your time in a way that allows you to meet them.

4. Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

[optional] If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

Note: missed work can only be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is not sufficient on its own.

5. Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

6. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Any calculator is allowed in exams.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Online Etiquette:

Some components of this course will involve online interactions. To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

- please "arrive" to class on time
- please use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive or personal material
- to minimize background noise, kindly mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- Please be prepared to turn your video camera off at the instructor's request if the internet connection becomes unstable
- You are not required to have a video camera for any portion of this course
- However, engagement is a lot easier if we can all see each other.
- unless invited by your instructor, do **not** share your screen in the meeting

The course instructor will act as moderator for the class and will deal with any questions from participants. To participate please consider the following:

- if you wish to speak, use the “raise hand” function and wait for the instructor to acknowledge you before beginning your comment or question
- remember to unmute your microphone and turn on your video camera before speaking
- self-identify when speaking.
- remember to mute your mic after speaking (unless directed otherwise)

General considerations of “netiquette”:

- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. “Flaming” is never appropriate.
- Be professional and scholarly in all online postings. Cite the ideas of others appropriately.

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

7. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at https://www.uwo.ca/health/student_support/survivor_support/get-help.html. To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at http://academicsupport.uwo.ca/accessible_education/index.html if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual

support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.

8. Land acknowledgment

We acknowledge that Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron peoples, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. This land continues to be home to diverse Indigenous peoples (e.g. First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society.