

# Biology 2601a: Organismal Physiology

September – December 2024

## 1. Course Information

Biology 2601a, Organismal Physiology, is an entirely in-person course with 2 hours of lecture plus 1 hour lecture/tutorial per week.

### List of Prerequisites

A minimum mark of 60% in either Biology 1001A or Biology 1201A and a minimum mark of 60% in either Biology 1002B or Biology 1202B or Integrated Science 1001X are required. Unless you have either the requisites for this course or written special permission from your Dean's Designate (i.e., Department/Program Counsellors and Science Academic Counselling) 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	Office Hours
Dr. Mark A. Bernards (Course Coordinator)	bernards@uwo.ca	NCB 402	X86477	See below
Dr. James F. Staples	jfstaples@uwo.ca	B&GS 3020	X84057	See below

Students are required to first **use the *Discussions* on OWL Brightspace (under Communications) to pose questions about the course** content; answers should first be provided by their peers. The instructors will monitor *Discussions* regularly and provide answers/corrections as needed. The instructors will be available for office hours via Zoom (recurring meeting coordinates available through Brightspace) on Mondays and Wednesdays at 1PM, or by appointment. To make an appointment send an e-mail from your @uwo.ca account only, include "Bio 2601" in the subject line, and list several days and times when you are free to facilitate scheduling. Instructors will answer questions about general course material and policies, and about the lectures they deliver (e.g., Dr. Staples will answer questions about the lectures he gives and Dr. Bernards will answer questions about the lectures he gives).

### 3. Course Syllabus, Schedule, Delivery Mode

This course provides a general background in the mechanisms and consequences of physiological processes in plants and animals. It will take an integrated approach and include a comparative context, wherever possible.

#### Lecture Topics include:

Homeostasis and physiological plasticity	Gas Exchange
Effects of temperature	Nutrient acquisition and use
Energy metabolism	Fluid transport
Water and ion balance	Hormonal and neural regulation

#### Learning Outcomes:

From lecture materials and readings, students will be able to identify:

- how organisms maintain homeostasis of energy, ions, water and gases
- how temperature affects physiology and biochemistry, including  $Q_{10}$  effects
- the patterns of thermoregulation of organisms, and their underlying mechanisms
- the processes of photosynthesis and mitochondrial respiration, including the roles of key enzymes, substrates and products
- the principles of gas exchange, including diffusion and gas solubility in water, in order to explain how organisms exchange  $O_2$  and  $CO_2$  with their environment
- the principles of water balance, including osmosis, to describe how organisms maintain a homeostatic water balance as their environment changes
- the principles of fluid transport, in order to explain the various physiological systems used by animals to transport internal fluids
- how water is transported in plants and the use of equations for water potential to calculate the direction of water movement in plants
- the nutritional needs of plants and the physiological mechanisms underlying plant nutrient acquisition
- the anatomical structures of a plant, including leaf, stem and root cross-sectional anatomy
- how excretory systems and epithelia of animals regulates ions and water
- basic organization and function of endocrine systems
- hormonal regulation of plant function, and hormonal and neural regulation in animals

Classes begin: September 5, 2024

Fall Reading Week: October 12 – 20

Classes end: December 6, 2024

Final Exam period: December 9 – 22, 2024

#### Mode of delivery

Lectures will be held in-person. Lecture materials will be posted on the course Brightspace page; however, no recordings of lectures will be available.

**OWL:** Students are responsible for checking OWL Brightspace (<https://westernu.brightspace.com/d21/home>) on a regular basis for news and updates. *OWL is the primary method by which information will be disseminated to all students in the class.* All course

material, including lecture materials, readings, and quizzes will appear on the OWL site. In addition, important announcements will be made on OWL, and you are responsible for obtaining this information.

**OWL Discussions** is available for you to ask content-related questions, discuss concepts, and to help each other. The instructors will monitor these Discussions and respond to content questions, but most questions will be answered by other members of the class. Use of social media group sites for the sharing of course information and discussions is neither sanctioned nor recommended.

If students need assistance with OWL, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). The helpdesk can be contacted by phone at 519-661-3800 or ext. 83800.

### Participation and Engagement

- Students are expected to participate and engage with content as much as possible
- Students should also participate by interacting in the forums with their peers and instructors

### Contingency plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

## 4. Course Materials

**Readings:** No publisher produces a textbook that includes both plant and animal physiology at a level that is appropriate for this course. We will use material from two different texts:

**Hill, R.W., Wyse, G.A. & Anderson, M.** 2021. *Animal Physiology, Fifth Edition*. Sinauer, Sunderland, MA.

**Taiz, L., Møller I.M., Murphy A. & Zeiger, E.,** 2022. *Plant Physiology and Development, Seventh Edition*. Sinauer, Sunderland, MA.

To keep your costs down, a bundled loose-leaf version and eBook rentals of both textbooks are available at the bookstore. The hardcover texts are also available. If you use earlier editions or other textbooks, you will not receive assistance in identifying suitable readings. You can purchase the bundled books (coursepac) or eBook rentals through the Western Bookstore at:

[https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2023A&courses%5B0%5D=001\\_UW/BIO2601A](https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2023A&courses%5B0%5D=001_UW/BIO2601A)

All course material will be posted to OWL: <https://westernu.brightspace.com/>

Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Lectures will include references to additional readings to give you broader and deeper information, and will also give you a different form of explanation. The material presented in the **lectures** and **assigned readings** defines the examinable material, so you are advised to make notes first from the lectures, and then use the readings to clarify and increase your knowledge and understanding.

## Technical Requirements

Quizzes will be administered through OWL Brightspace. In addition, if the course needs to move on-line, you will need a stable internet connection and a computer with a working microphone and webcam.

# 5. Methods of Evaluation

## Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

Weekly Quizzes (#)	15%	(the top 6 of 9 quizzes will count)
Midterm Test 1	20%	(based on lectures 2-10)
Midterm Test 2	20%	(based on lectures 13-25)
Final Exam	45%	(cumulative with emphasis on lectures 28-37)

Your marks will be regularly updated under ‘Grades’ in OWL. You may query any apparent inconsistencies between what you thought you received and what is on OWL. When assessing these marks, keep in mind you will not have grades for things that have not yet been marked.

The final grade for the course will be calculated as the sum of the marks for each of the components. This mark will then be rounded to the nearest integer. No marks will be awarded for arbitrary reasons, and there will be no after-the-fact changes (e.g., of 69 to 70%).

**Weekly Quizzes:** Quizzes will be available via OWL Brightspace at the end the Thursday lecture of each non-midterm week, and will be based on the readings and lecture content from that week (see below). Each quiz is worth 2.5% of the final grade for a total of 15%. **There are no make-up quizzes.** Quiz access closes at the start of the next day’s lecture and will be reviewed at the start of that lecture.

**Mid-term Exams:** There are two mid-term exams. Mid-term exam 1 covers material from Lecture 2 through Lecture 10, inclusive. Mid-term exam 2 covers material from Lecture 13 through Lecture 25, inclusive. Material covered in required readings within these lecture brackets are also testable. Both mid-term exams will be held during regularly scheduled class time, but location may be different; we will announce location details in class and through OWL. As the Final Exam is cumulative, **there are no make-up mid-term exams.**

**Final Exam:** The final exam will be 3 hours in duration. It will be based on **all** the material covered in the course, including lectures and required readings, with emphasis on materials from Lecture 28 through 37, inclusive. The date of the final exam will be determined by the Registrar’s office. Use of

pocket calculators, tablets, iPods, cellular phones, laptop computers or any other electronic devices is not allowed during exams unless directed or approved by the instructors.

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work which is clearly above average
B	70-79	Good work, meeting all requirements, and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

### General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/academic\\_consideration\\_Sep24.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf),

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar’s webpage:

[https://registrar.uwo.ca/academics/academic\\_considerations/](https://registrar.uwo.ca/academics/academic_considerations/)

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- Examinations scheduled during official examination periods (Defined by policy)

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above, the request cannot be recalled and reapplied. This privilege is forfeited.

### Evaluation Scheme for Missed Assessments

**Quizzes:** There are no make-up quizzes. Only the highest 6 grades from quizzes will be counted.

**Mid-term exams:** Students who miss either mid-term exam must obtain Academic Consideration from their Dean’s Academic Counselling office, with appropriate documentation as relevant. With a valid Academic Consideration the weight of the missed mid-term exam(s) (20% or 40%) will be added to the final exam.

**Final Examination:** 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 (commonly referred to as 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). Arrangements for this are also to be made through your deans’ Academic Counselling office.

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if a second Academic Consideration is 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 Academic Calendar for details (under [Special Examinations](#)).

## 6. Additional Statements

### Land Acknowledgement

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.

### EDI Statement

This course supports the goals of equity, diversity and inclusion. Science and learning are best achieved by diverse participants having equal opportunities and feeling valued and included.

### Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university’s EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca>.

### 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](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

### Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

In accordance with policy,

[https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](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.

Use of pocket calculators, tablets, iPods, cellular phones, laptop computers or any other electronic devices is not allowed during exams unless directed or approved by the instructors.

**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:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

### **Support Services**

Please visit the Science & Basic Medical Sciences Academic Advising 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](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](mailto: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](http://academicsupport.uwo.ca/accessible_education/index.html)

if you have any questions regarding accommodations.

Learning-skills counsellors at Learning Development and Success (<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.