

# BIOLOGY 4405B – ECOSYSTEM ECOLOGY

## Winter 2024 Course Outline

### 1. Course Information

**Course Title:** Biology 4405B – Ecosystem Ecology  
**Session:** Winter 2024

**Lectures:**

#### List of Prerequisites

- a) Biology 2483A/B – Ecology
- b) Any 0.5 Biology course at the 3000-level

If you neither have the prerequisites for this course, nor written special permission from the Dean to enroll in it, you will 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 and Contact Information

**Course-related email must be sent to:**

Emails from students sent to other email addresses concerning course-related matters will not be responded to. Students **must** use their Western (@uwo.ca) email addresses when contacting their instructors. Emails from other domains will not be responded to. Although the course email address will be reviewed and responded to within one business day and during normal business hours, we cannot guarantee response to questions within the 24-hour period prior to the deadline for graded work.

Individual meetings may be requested at any time to address matters that are not suitable for office hours. Use the course email address above to request a meeting with the instructor.

### **3. Course Description**

This course traces the flow of water, energy, and nutrients from their abiotic origins, to their cycles through microbes, plants, and animals. This course will synthesize current advances in ecology with established theory to offer a comprehensive survey of ecosystem pattern and process.

#### **Course Objectives**

Understanding the structure and function of ecosystems is fundamental to their conservation and necessary for the remediation of impacted environments. Ecosystem ecology is an area of active research nationally and internationally, and perspectives gained from the "ecosystem approach" have proven valuable to conservation biologists, natural resource management agencies, and governments at all levels.

The goals of this course are:

- a) To teach you the basic principles of ecosystem ecology with a focus on terrestrial systems. This includes principles and theories on the relationships between terrestrial life and abiotic factors in the environment to understand major pathways by which carbon, nutrients, and water cycle through the environment, and how energy passes through terrestrial ecosystems. We will also draw on examples from freshwater and marine systems, where appropriate.
- b) To teach you to critically read and evaluate papers from the primary literature. Lectures will be supplemented with in-depth readings to demonstrate methodological, applied or theoretical principles in ecosystem ecology. Discussion sessions will help you develop skills at reading, interpreting and critically evaluating scientific articles.

#### **Learning Outcomes**

Through the review of the lecture material textbook and other assigned reading materials, in exam assessments students should be able to:

- a) Understand and outline the biotic and abiotic factors that define and differentiate Earth ecosystems.
- b) Understand the basic flows of energy or nutrients within ecological systems and be able to describe them in a systems framework (e.g. stocks and flows; mass balance).
- c) Describe the factors that affect (and disrupt) the functioning of ecological systems.

As a result of attending the lectures and literature discussion sessions, in exam assessments students should be able to:

- a) Understand and explain the links among biotic and abiotic components of ecosystems.
- b) Describe current trends in global biogeochemical cycles.
- c) Identify and describe stressors like climate change on global ecosystems.

### **Mode of Delivery**

Formal lectures will be conducted in person during the **Monday** lecture time (entire class). Weekly discussion of the assigned reading will be conducted in person during the **Wednesday** lecture time (entire class). All in person classes for the 2024 Winter term are in Western Science Centre Room 240.

**Contingency Plan:** This course will be delivered in-person, however in the unlikely event of any university-declared emergency, some or all of this course may be required to be delivered online, either synchronously or asynchronously. The grading scheme will not change. Any assessments affected will be conducted online as determined by the professor.

### **4. Course Materials**

**Website:** <http://owl.uwo.ca>. Links to asynchronous lecture presentations will be posted on OWL. PDF files of lecture presentations will be posted on OWL. These files will be available in PDF format only. The course website will be the primary method of communication with students outside of lecture. All important documents (syllabus, lectures, assigned readings, updates etc.) will be posted to the website. It is your responsibility to check the website frequently.

**Required Textbook** (Assigned, Examinable Readings e-book): *Principles of Terrestrial Ecosystem Ecology*. FS Chapin III, P Matson, H Mooney, Springer-Verlag, New York, 2002.

This excellent text is available as an e-book that may be viewed online or downloaded from the UWO library online collection. Search for the book title on the library home page (<https://www.lib.uwo.ca/>), find the listing that indicates [electronic resource], and follow the links. Many lecture figures and concepts are drawn from this text, and material in assigned pages/sections of this resource will be examinable.

**Other Required Readings:** PDFs/links will be posted on the course website. Students are expected to complete readings before the corresponding discussion during the Wednesday lecture period. These readings are also the basis of the Brief Article Review assessments that are part of the course grade evaluation (see below).

## 6. Methods of Evaluation

The overall course grade will be calculated as listed below:

### Evaluation

Reading assignments	Brief Article Review (x2)	20%
Midterm test 1		20%
Midterm test 2		25%
Final exam (cumulative)	(Scheduled by university)	35%

### Brief Article Review

Weekly readings will assigned at the beginning of the semester, and be discussed, one at a time, during the Wednesday class over the semester. You will be expected to have reviewed the assigned readings prior to the corresponding class. All assigned readings are potential exam material. For the Brief Article Review assignment you will **chose any two (2)** of the assigned readings and write a short overview of the article to be submitted electronically in OWL prior to the synchronous class in which that article will be discussed openly. The Review must include three (3) components: 1) a complete bibliographical citation of the material, 2) a brief but complete description of the major research finding(s) of the article, and 3) a description on the importance of the findings, based on your prior knowledge, current events, and state of scientific knowledge in the area. With the exception of the citation itself (point 1), the assignment should be written in your own words. Detailed information on the assignment will be available on OWL in the 'Resources' folder for 4405.

### Examinations

There will be two in-class term exams and a cumulative final exam in this course; all exams are compulsory. Students are responsible for material presented in lecture, the course textbook, and in the assigned readings. You can expect the exams to include any or all of the following question types: multiple choice, matching, fill-in-the-blank, short answer and/or essay.

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

## 6. Student Absences

**Missed term tests** will receive a grade of 0 (zero) unless formal accommodation for is provided. Formal accommodation circumstances must be communicated to the instructor as per faculty regulations. A make-up test for missed term tests will be offered within one calendar week after the scheduled date of the term test. In the event that the make-up test is also missed for verifiable, approved reasons, then the value of the missed test will be added to the value of the final examination. You must provide valid medical or supporting documentation to the

Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at:  
[https://uwo.ca/univsec/pdf/academic\\_policies/appeals/academic\\_consideration.pdf](https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration.pdf).

The Student Medical Certificate is available at:  
[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

**Missed final exams:** 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).

**Brief Article Reviews.** As there are 10 opportunities to complete 2 brief article reviews over the semester, no accommodation of any sort will be accepted for Brief Article Reviews. There are no late submissions accepted because once the article is discussed in the weekly sessions, the article is no longer available to be used for graded work.

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

## 8. 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](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.

There are no aids of any kind permitted during any formal assessment (quizzes, exams) for this course.

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

**Plagiarism:** Plagiarism is an academic offense and will not be tolerated. Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author they must acknowledge their debt both by using quotation marks where appropriate, and by proper and accurate referencing in the form of scientific citations. All required papers will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

## 9. 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](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 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/>.

## **10. Land Acknowledgement**

Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak, and Chonnonton Nations, 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 (First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society. Throughout Canada, North America, and the world, Indigenous Peoples are vital contributors to their communities, and we greatly value their presence, knowledge, and wisdom.