

# **BIOLOGY 4405B – ECOSYSTEM ECOLOGY**

**Winter 2022**

**Course Outline (Syllabus) For Undergraduate Courses**

## **1. General Course Information**

**Course Title:** Biology 4405B – Ecosystem Ecology

**Session:** Winter 2022

### **Lectures:**

**Monday 1:30 pm – 3:30 pm, Wednesday 1:30 pm – 2:30 pm** (see mode of delivery section below for description of temporary online measures)

### **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.

### **Mode of Delivery**

Up to and including Wednesday January 26, 2022 (or the date of return to in-person learning at the direction of University Administration):

Formal lectures in video format with supporting lecture PDFs (two 50 minute class equivalents) will be posted online for asynchronous viewing each week. Students are expected to review this material as it is made available.

Weekly discussion of the assigned reading will be conducted in a synchronous session via **Zoom®** during the Monday lecture time slot. Students will be assigned by the instructor into one of two 50 minute sessions during the two-hour block. You are to only attend the session that you are assigned to. The intention of conducting two sessions is to allow the instructor and class to informally interact 'in person' in a meaningful way with a smaller number of participants.

### After Return to In-person Learning:

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). Upon the return to in-person classes, asynchronous recorded lectures will no longer be provided. All in person classes for the 2022 Winter term are in UCC-56.

All course material will be posted to OWL: <http://owl.uwo.ca>. Any and all communications concerning course content, scheduling, mode of delivery and any other course related information (planned and unplanned) will be communicated on the OWL site. It is the responsibility of students registered in the course to ensure that they have access to the Biology 4405B OWL site, and to check your uwo.ca email and the course OWL site daily for announcements and updates.

If students need assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They may be contacted electronically via the links provided, or can be contacted by phone at 519-661-3800.

In accordance with Western University recommendations, [Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally access OWL; the use of other web browsers are at a student's own risk. It is recommended that students keep their computer operating systems and web browsers regularly updated.

## **Online Participation and Engagement**

**During online learning:** Outside of synchronous discussion sessions, students are expected to review and engage with asynchronous content in a scholarly fashion and on a weekly basis.

Students may post questions for the instructor or classmates for the purposes of discussion about lecture material or course-related readings on designated OWL Forums.

Students are encouraged to participate in scheduled office hour sessions with their instructor.

## **2. Instructor and Contact Information**

Dr. Brian Branfireun, Professor, Department of Biology, Room 2064 Biological and Geological Sciences Building

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

[bio4405@uwo.ca](mailto:bio4405@uwo.ca)

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 ([bio4405@uwo.ca](mailto:bio4405@uwo.ca)) 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.

Office hours will be held weekly on Wednesdays from 10:30 – 11:30 in an open Zoom session (during both online and in-person learning modes). Links to the office hour Zoom meeting will be in the OWL Calendar. Any student may attend this session at any time to engage in question and answer.

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/Syllabus**

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, nitrogen, phosphorus 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 use a biome concept to recognize and categorize the variety of terrestrial ecosystems on Earth. We will explore terrestrial habitats from tropical rainforests to the arctic tundra, from the scale of the smallest soil particles to interactions among regions at a global scale.
- c) 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 biomes.
- 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 literature discussion sessions, in exam assessments students should be able to:

- a) Understand and explain the link between biotic and abiotic components of ecosystems.
- b) Describe current trends in global biogeochemical cycles.
- c) Identify and list anthropogenic stressors on different Canadian terrestrial biomes.

#### 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 (either Monday synchronous online discussion while learning is remote, or Wednesday after the return to in-person class). These readings are also the basis of the Brief Article Review assessments that are part of the course grade evaluation (see below).

#### 5. Course Technical Requirements

You must have access to a computer or tablet with the following:

- Stable internet connection
- A word processing application to complete written assignments
- Zoom® application installed
- Working microphone and webcam

Students interested in evaluating their internet speed can click [here](#). A stable internet connection is needed for both the synchronous discussion sessions, attendance of office hours, as well as tests and exams which will be conducted online. A dedicated wired network connection is preferred. (most home WiFi routers support wired ethernet connectivity). Off-campus shared WiFi networks are the least reliable and should not be trusted for critical online activities such as tests and exams where a stable connection is essential.

## 6. Methods of Evaluation

The overall course grade will be calculated as listed below:

### Evaluation

Participation	Attendance of synchronous/in person discussion sessions	20%
Reading assignments	Brief Article Review (x2)	20%
Midterm test 1	Online (tentative date Feb 9)	20%
Midterm test 2	Online (tentative date Mar 15)	20%
Final exam (cumulative)	(Scheduled by university)	20%

### Participation

Participation in assigned weekly reading discussion (online and/or in-person) will be evaluated through attendance logs, responses to polls, non-graded quiz questions, and other online mechanisms implemented by the instructor during each session.

### Brief Article Review

Weekly readings will be discussed formally during Monday synchronous sessions while classes are on-line, and during the Wednesday class when in-person. You will be expected to do the assigned readings prior to the corresponding class. All assigned readings are potential exam material. For the Brief Article Review assignment you will **choose 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 Short 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

### **Accommodated Evaluations**

#### **Information about late or missed evaluations:**

**Missed term tests** with self-reported absence (SRA). You are required to notify your instructor for self-reported absences. If you do not communicate with your instructor by the date given in the SRA portal, the self-reported absence will be considered VOID and you will receive a grade of 0% for the course component indicated. A make-up test for missed term tests with SRAs will be offered and must be completed within one calendar week.

A missed term test without SRA (or formal accommodation) will receive a grade of 0 (zero). Formal accommodation circumstances must be communicated to the instructor and will be managed on a case-by-case basis.

**Missed final exams** require formal accommodation and are not managed by the course instructor.

**Brief Article Reviews.** SRAs will not be accepted for Brief Article Reviews and will not be re-weighted. There are 10 opportunities to complete 2 brief article summaries over the course of the term.

Participation is worth 2% per week. SRAs will not be accepted for participation marks.

See next page of this syllabus for more information and links.

## 6. EDI statement

I seek to create a learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors your identities. To help accomplish this:

- If you have a name and/or set of pronouns that you prefer, please let me know!
- If you feel like your performance in the class is being impacted by your experiences outside of class, please do not hesitate to schedule a private meeting with me, or send me an email.
- If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it.
- Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

## 7. 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.

More information about Indigenous Services (<https://indigenous.uwo.ca/>) and this Land Acknowledgement (<https://communications.uwo.ca/comms/land-acknowledgement/>) are available.

In this course, we also acknowledge the historical and ongoing injustices that Indigenous Peoples endure in Canada, and we accept responsibility to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching.

## 8. Accommodation and Accessibility

### Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy 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 Consideration for Student Absence

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)

- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Consideration\\_for\\_absences.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf)

and for the Student Medical Certificate (SMC), see:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

### **Religious Accommodation**

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance.

Additional information is given in the Western Multicultural Calendar:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see [http://www.registrar.uwo.ca/examinations/exam\\_schedule.html](http://www.registrar.uwo.ca/examinations/exam_schedule.html)).

[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 Academic Calendar for details (under Special Examinations).

## **9. Academic Policies**

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

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, 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 his/her official university address is attended to in a timely manner.



**All of the remote learning sessions for this course will be recorded.** The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for course management purposes (e.g. participation, misconduct, ethics) by the instructor and will not be circulated.

Participants in this course are not permitted to audio or video record the sessions using online or other devices, except where recording is an official accommodation, and has instructor approval.

**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:** Students must write each assignment in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt by using quotation marks where appropriate (rare in science) and/or by properly paraphrasing and appropriately citing the source of the information. You are expected to know what plagiarism is at this stage of your programme.

Turnitin aids in identifying plagiarism. 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>).

### **Professionalism & Privacy:**

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

- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- All recorded sessions will remain within the course site or are unlisted if streamed
- Recordings by students of lecture materials or live sessions are not permitted (audio or video)
- Students are expected to adhere to online etiquette expectations provided below
- Students may be expected to agree to an academic integrity pledge before some assessments

### **Online Etiquette:**

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:

- “arrive” to synchronous sessions on time
- use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that your ‘screen name’ is your full name as it would appear on the course enrollment list in OWL.

- ensure that you are in a private and quiet location to permit thoughtful engagement in the online components of the course without distraction.
- to minimize background noise, mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- to optimize bandwidth and web quality, you may turn off your video camera for the entire class unless you are invited to speak
- please be prepared to turn your video camera off at the instructor's request if the internet connection becomes unstable
- unless invited by your instructor, do not share your screen in the meeting
- The course instructor or TA 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.
- Please remember to unmute your microphone and turn on your video camera before speaking.
- Self-identify when speaking.
- Please remember to mute your mic and turn off your video camera after speaking (unless directed otherwise).

General considerations of "netiquette":

- Be respectful of the different cultural and linguistic backgrounds of the students in the course. Speak clearly.
- Be courteous toward the instructor and your classmates.
- 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. Hostile language, raised voices and "flaming" are never appropriate.
- Be professional and scholarly in all online postings. Use proper grammar and spelling. 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.

## 10. Support Services

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

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 Student Accessibility Services (SAS) at 661-2147 if you have any questions regarding accommodations.

The policy on Accommodation for Students with Disabilities can be found here:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic%20Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf)

The policy on Accommodation for Religious Holidays can be found here:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_religious.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf)

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/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.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.

Students who are in emotional/mental distress should refer to Mental Health@Western ([http://www.health.uwo.ca/mental\\_health](http://www.health.uwo.ca/mental_health)) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC,

<http://westernusc.ca/services>.

The following links provide information about support services at Western University.

[Academic Counselling \(Science and Basic Medical Sciences\)](#)

[Appeal Procedures](#)

[Registrarial Services](#)

[Student Development Services](#)

[Student Health Services](#)

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