

Biology 3425G Course Outline

Global Change Biology

Winter Term 2024

1. Course Information

Course Information

Delivery: Class for Biology 3425G in the Winter Term 2024 will consist of a 50-minute lecture followed by questions on the lecture material. We will reconvene after a brief break for ~50 minutes of small group discussions, followed by another short break, and then a ~50-minute whole class discussion. Discussion topics will be presented with each week's lecture notes.

List of Prerequisites

[Biology 2290F/G](#); [Biology 2483A/B](#); [Biology 2601A/B](#). Unless you have either the requisites for this course or written special permission from your Dean or Dean's Designate (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 if you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Instructor: Dr. Natasha MacBean	nmacbean@uwo.ca	-	-	-
TA: Ryan Spencer Conklin	rconkli@uwo.ca	-	-	-

Office hours will take place via Zoom. Please contact Dr. MacBean or Mr Conklin via email in advance to arrange a specific time for the meeting and you will receive a zoom link. Students can also use the Forum on OWL to pose questions and discuss topics amongst themselves. Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

Please email Dr. MacBean and Mr Conklin with all other queries via their Western emails. Emails will be monitored daily; students will receive a response in 24 – 48 hours.

3. Course Syllabus, Schedule, Delivery Mode

This course will investigate concepts and issues associated with the response of organisms, communities and ecosystems to global-scale changes in the environment Topics covered will include changes in

atmospheric CO₂ concentration, global warming, changes to the nitrogen cycle, and invasive species biology.

Learning Outcomes: From lecture materials and readings, students will be able to describe:

- the impact of atmospheric CO₂ on the global carbon cycle
- the physiological effects of rising atmospheric CO₂ on biological systems
- how warming affects organisms and ecosystem processes (like heterotrophic respiration)
- what land use change is and why it is occurring
- how land use change impacts organisms
- the nitrogen cycle and how eutrophication affects organisms and ecosystems
- what an invasive species is and how they impact communities
- how biodiversity loss impacts the functioning of communities
- how global change factors interact with each other

In addition, students will be able to critically examine the peer-reviewed research literature and develop their scientific research skills in order to assess: a) critically assess whether past studies are cited correctly; b) identify gaps in existing research; c) how to perform a literature review; and d) how to formulate hypotheses and/or research questions that extend existing research.

Classes begin: January 8, 2024

Fall Reading Week: February 17-25, 2024

Classes end: April 8, 2024

TENTATIVE CALENDAR 2024: *Students will be informed in advance of any upcoming changes.*

Week	Dates	Topic
1	January 12	Introduction, global change, past and future
2	January 19	Elevated CO ₂ – the carbon cycle and effects on organisms
3	January 26	Elevated CO ₂ – effects on communities and ecosystems
4	February 2	Global warming – causes and effects on organisms
5	February 9	Global warming – effects on higher ecological scales
6	February 16	Land use change – patterns and drivers <i>*Paper summary due on February 16th by 11:55pm</i>
	February 23	<i>Reading Week – No Class</i>
7	March 1	Land use change – effects on organisms
8	March 8	Eutrophication – the nitrogen cycle and effects on plants, communities, and ecosystems
9	March 15	Invasive species – definitions and patterns
10	March 22	Biodiversity loss
11	March 29	<i>No Class</i>
12	April 5	Multi-factor global climate and environmental change <i>*Term paper due on April 5th by 11:55pm</i>

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

Readings: Readings will be assigned from the primary literature and will be posted to the OWL course site. You are expected to have read the assigned paper(s) and considered the main topics for a given week *prior* to coming to class, in order to be able to follow the material and contribute to discussions. Discussion participation is a significant component of the grade, and attendance is mandatory.

Required equipment: Laptop or computer for assignments and stable internet connection for access to OWL.

Website: An OWL website has been established for this course. All course documents and information (syllabus, lecture files, instructional documents, required readings, grades, etc.) **will be posted to OWL and students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for updates and announcements.**

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

Your marks will be regularly updated under 'Gradebook' 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 marks for things that have not yet been marked.

Personal Response Systems ("Clickers") are not used in this course.

5. Methods of Evaluation

Course assessment: The overall course grade will be calculated as listed below (*with due dates for major assignments):

- 15% Class Participation (see below for details)
- 20% Weekly Readings (see below for details)
- 20% Quizzes (see below for details)
- 15% Midterm Critical Citation Assessment (see below for details; *due Friday, February 16)
- 30% Term paper (see below for details; *due Friday, April 5)

Please read the sections on university and course policies below.

Your final grade for the course will be calculated as the sum of your 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%).

- Written assignments will be submitted to Turnitin (statement in policies below).
- Students will have 2 submissions to Turnitin (Midterm Critical Citation Assessment and Term Paper).
- After an assessment is returned, students should wait 24 hours to digest feedback before emailing Dr. MacBean or the TA.

Class Participation: 15% of the course grade will reflect attendance and meaningful participation in discussions. Your participation in the discussion section is essential for your own development as a scientist and leader, and all students are expected to contribute on a weekly basis. During discussion sections, electronic devices are only permitted if they are being used to look up information that is pertinent to the discussion, or to take notes. The Class Participation grade will be broken down into four parts:

1. **Attendance (5%)** – attendance is mandatory. For more information, see course policies on attendance and missed classes below.
2. **Group discussion participation (4%)**: all groups will be evaluated weekly on the level of their discussion, inclusiveness of all members of the group, and how thoroughly they discuss the question/discussion topic.
3. **Group discussion spokesperson report back (3%)**: Each student will report back on their group's discussion session **once during the term** (students will organise themselves to take it in turns to do this each week). The grade will be based on the clarity, completeness, and conciseness of their report back. The spokesperson will work with another student in the group who will be the official note taker for that week to come up with a summary of the group's discussion. No submission is needed for this assignment. Report backs will be given a mark of 0 (no report), 1 (report given, but lacking clarity or detail), 2 (adequate), or 3 (good), depending on the level of detail and clarity of the notes. Grades will be uploaded to OWL for all students at the end of the semester.
4. **Group discussion note taker report (3%)**: Each student will be the official "note taker" for their group's discussion session **once during the term** (students will organise themselves to take it in turns to do this each week). The note taker will work with another student in the group who will be the official "spokesperson" for the group for that week to come up with a summary of the group's discussion to present to the rest of the class. The note taker will upload their notes in a word or pdf file for this assignment by the end of each class. A 10% per day late policy will be applied. Note taker reports will be given a mark of 0 (no report submitted), 1 (report submitted, but insufficient detail), 2 (adequate) or 3 (good), depending on the level of detail and clarity of the notes. Grades will be uploaded to OWL for all students at the end of the semester.

Weekly Readings: Students will have between two and four papers assigned each week (pdfs posted on OWL). Before class, each student will submit a short answer response regarding the week's reading material. There will be three components to the short response: 1) summarise the key findings of one of the weekly readings in up to 3 bullet points; 2) describe one caveat or limitation of the study presented in the selected paper (comparing to the other papers in that week's reading list may help if that paper finds conflicting results); and 3) propose a hypothesis, experiment, or a research objective or question that would advance or further develop the study presented in the selected paper. Submissions will be given a mark of between 0 (no questions submitted) and 3 (outstanding). Students must complete all three components of the response to achieve a grade of 3. The cumulative score for the weekly reading submissions at the end of class will make up 20% of your final mark. The lowest grade for the weekly reading submissions will be dropped. **A 10% per day late policy will be applied.**

Quizzes: Each week, there will be an online quiz covering the material from the previous week's lecture. Each quiz will consist of one long answer question. The quizzes will be run through the OWL Tests and Quizzes tab and will be available to for ~24 hours before class, though each quiz will be timed once you begin it. The quiz should only take about 10 minutes to complete; however, students will have 15 minutes to complete each quiz. The quizzes will cumulatively account for 20% of the course grade. The lowest quiz grade will be dropped. **A 10% per day late policy will be applied.**

Midterm Critical Citation Assessment: For 15% of the course grade, students will read an assigned paper on a current global change biology topic and then complete a critical assessment of whether three peer reviewed articles (out of six provided) have correctly or poorly/incorrectly cited the assigned paper (and why). The goal here is to learn how to correctly identify: a) how, and for what, peer-reviewed journal articles cite past studies; and b) how past studies can be poorly or incorrectly cited. The assigned paper, six papers that have cited the assigned paper, and a word template with sections to complete (with word counts) for the critical citation assessment will be provided on OWL. This assignment will be open from the start of the 1st class, and the assessment (completed word document) must be submitted on-line through the OWL site, via turnitin.com, by 11:55 pm on **Friday 16th February**.

Term Paper: For 30% of the course grade, you are to write a term paper with a literature review of three papers that *extend, advance* or *add to* what we have learned in class about elevated CO₂, global warming/climate change or land use change impacts on biological systems (at any scale) – i.e., the 1st three major topics that we cover in the first 7 weeks of class. Examples will be given in class, in addition to tips on how to perform a literature review and search for journal articles. The paper should be between 3000-3500 words, not including references or figures, with single-spaced or 1.15 spaced text, 12-point Calibri font, and 1-inch margins. References should focus on the primary literature (i.e., research and review papers). The paper must be submitted on-line through the OWL site, via turnitin.com, by 11:55 pm on **Friday 5th April**. The Term Paper assignment will be open from the start of the 1st class.

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The list 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

NOTE: Students must get a passing grade (D or above/50+) on the Midterm Critical Citation Assessment and Term Paper to satisfy the Senate requirement that students must demonstrate “some minimal competence in essay writing” in order to pass this essay course. (Please see following sections for late work and student absence policies for these two components of the course).

6. Student Absences and Missed/Late Evaluations

- **Attendance in class is mandatory and class participation is a significant component of your final grade** (see Section 5). Attendance will be taken each week, and grades for group discussion (and attendance) will be given each week (although the final class participation grade will only be submitted to Gradebook at the end of the semester).
- If students miss class or any assessment due to illness or another serious circumstance for **three weeks or more**, they will be **required to provide proof** of the reason for their absence in order to make up the grade.

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below:

Information about late or missed evaluations for assessments worth less than 10% of the overall course grade:

Late assignments

- Late assessments for the quizzes and weekly reading question assignments **without illness self-reports (or another university recognised absence)** will be subject to a late penalty of 10% per day.
- Late assessments for the quizzes and weekly reading question assignments **with illness self-reports (or with a reported university recognised absence)** (and proof, if three or more weeks of class have been missed) should be submitted within 1 week of the original deadline. Additional time can be given on an ad hoc basis as needed.

Missing class

- There will be no late penalties available for missing class. Missed evaluations for class participation **without illness self-reports (or another university recognised absence)** will result in a grade of zero for that week.
- Missing attendance, or missed evaluations for class participation **with illness self-reports (or with a reported university recognised absence)** (and proof, if three or more weeks of class have been missed) will be re-weighted, i.e., the week of the excused absence will be removed from the students overall score for that category.

NOTE: The illness self-report/reason for missing the class and/or missing an assignment should be emailed to *both* Dr MacBean and the TA before the start of the class and/or before the due date for the assignment in order to make up the grade.

Information about late or missed evaluations for assessments worth 10% or more of the overall course grade:

For work totalling 10% or more of the final course grade, 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.

The Student Medical Certificate is available at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Students will be given an extension to complete the work after their case has been assessed and approved by Academic Counselling Office of your Faculty of Registration.

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 illness (e.g., COVID-19 symptoms) is **not** sufficient on its own.

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 work with Accessible Education (formerly SSD), 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.

8. EDI

The pronouns used by Dr. MacBean are she/her/hers and Mr Conklin are he/him/his.

9. 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 (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.

With this, we respect the longstanding relationships that Indigenous Nations have to this land, as they are the original caretakers. We acknowledge historical and ongoing injustices that Indigenous Peoples endure in Canada, and we accept responsibility as a public institution to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching, research and community service.

10. 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.

Electronic devices during quizzes and assignments: All quizzes and assignments are “open book” and students are encouraged to use materials from the course in addition to further literature search (for the term paper) to complete those quizzes and assignments.

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.

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>).

Turnitin: All required papers may 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:

- Students are expected to follow online etiquette expectations provided on OWL if we need to move the course to a virtual format.
- 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.
- All recorded sessions will remain within the course site or unlisted if streamed.

11. 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/>.