

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 (

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:

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. 2 Tf wry

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 | Gd wok, nm79 |

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

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.

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.