

BIOLOGY 463 - GLOBAL ECOLOGY SPRING 2024

In-Person Meeting Pattern: 10:30 AM every Wednesday (except 1st week)

Location: 3306 Life Sciences Building

Video Lectures: ~ 3 hours per week

Instructor: Dr. Bill Peterjohn
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Office hours: 1:30-3:00 PM MW
Other times or Zoom office hours can be arranged by sending me a request by email.

Course Description: (3 credit hours) This course provides students a fundamental understanding of how the Earth functions as a changing biogeochemical system. This is accomplished through recorded lectures, in-person class activities, readings, supplemental videos, and homework exercises. Collectively, these activities provide students with an intuitive and quantitative understanding of this timely and important topic. Specific topics include the structure, composition and dynamics of the ecosphere, nutrient cycles, changing atmospheric composition, and climate change.

Course Pre/Co-requisites: BIOL 221 or GEOG 307

Flipped Classes: All lectures for this course will be “flipped.” This means is that you will learn most of the content outside the classroom (via videos, readings, study questions, homework, etc.). We will then use weekly in-class meetings (every Wednesday) to answer your questions, clarify concepts, assess your comprehension, workshop potential test questions, and deepen your understanding through supplemental active learning projects.

Text: The textbook for this course is: The Earth System, 3rd Edition, by Kump, Kasting, and Crane. This book is available in the bookstore. Assignments from this book are given in the syllabus.

Course web site: Much of the information and materials needed for this class are found on the course web site at: www.as.wvu.edu/biology/bio463/

Recorded Lectures: Course lecture content will be provided by recordings of the class lectures found in a shared Google drive folder accessed through your university mix account. The link for the shared drive with the recorded lectures is:

<https://drive.google.com/drive/folders/1MVH72eObuQ7iIlrQRwdZCBhIKgGs6PLI?usp=sharing>

Students are expected to watch all video lectures as they are assigned, take notes, and learn the material they contain. Material covered in these video lectures will be on the exams and serve as the basis for weekly student questions, and weekly term identification assignments.

Lecture Handouts: Class handouts for the recorded lectures are available on the course web site (<https://www.as.wvu.edu/biology/bio463/Class%20Handouts.html>). These will be needed as you watch the recorded lectures and are available as both downloadable PDF and PowerPoint files.

Required readings: Additional readings will be placed on the course web site throughout the semester as Adobe Acrobat (PDF) files. The address for this site is: www.as.wvu.edu/biology/bio463/

Attendance: In-person attendance to the Wednesday in-person class meetings is required and will comprise 5% of your grade for the course. More than **one** unexcused absence after the first week of classes will result in no credit being awarded for attendance. One or fewer unexcused absences will result in full credit being awarded for attendance.

Unavoidable absences: If you miss class for an unavoidable reason, you must provide the instructor with a convincing written statement explaining the reason for your absence, and why it was unavoidable, no later than 1 week after your return to class. Your statement should note the dates missed and may include any documentation you wish to provide. An absence with an acceptable excuse (as determined by the instructor) will **not** be counted as an unexcused absence, and the instructor will try to help you make up the materials and assignments that were missed.

Missing an exam: If you miss an exam, you will receive a grade of zero for that exam. If an exam is missed due to an unavoidable absence, you must present a convincing written statement explaining the reason for your absence **no later than 1 week after the date of the exam you missed**. Your statement should note the dates that were missed and may include any documentation you wish to provide. Students with an acceptable excuse (as determined by the instructor) will be allowed to take a make-up exam.

Needed technology: To complete the assignments and learn the material for this course, all students will need a computer with access to the internet. On your computer you will need Microsoft Excel, Microsoft Word (both available in MS Office), Zoom, Adobe Acrobat Reader (or some other program that can handle PDF files), the ability to send/receive email, and internet browsing software.

MS Office is available for free to you at: <https://wvu.atlassian.net/servicedesk/customer/portal/5/article/299303302>

Zoom can be obtained for free at: zoom.us/download.

Adobe Acrobat Reader DC is a free download from: get.adobe.com/reader/

Course-specific learning outcomes: Upon successful completion of this course, students will be able to:

- 1) Explain how the major components of the Earth system (lithosphere, hydrosphere, atmosphere, & biosphere) interact to influence the near surface environment of the planet.
- 2) Read, understand, and summarize articles from the scientific literature that relate to the topic of global ecology.
- 3) Describe how the global environment has changed in the past.
- 4) Describe how human activities are changing Earth's climate and other aspects of the global environment and compare these changes to how the global environment has changed in the past.
- 5) Quantitatively assess the importance of Earth system processes and the influence of human activities on these processes.
- 6) Apply systems concepts and methodologies to analyze and understand interactions between environmental processes.

Grades: Course grades will be based on a students' performance on three exams, homework assignments, "In the News" assignments, periodic (~ weekly) review questions, and attendance.

- **Exams (70% of course grade):** There will be two mid-term examinations and a final. To ensure that you have sufficient time to complete the mid-terms, these exams will be given in the evening from **6:30-8:30 PM** on the dates indicated on your syllabus. The **lowest two exam grades** will each comprise **20% of your grade** for the course. Your **highest exam grade** will comprise **30% of your grade** for the course. The dates for each exam are as follows:

Mid-term I	February 7	(6:30-8:30 PM)
Mid-term II	March 20	(6:30-8:30 PM)
Final Exam	May 2	(2-4 PM)

Exams will contain questions from the lectures, class handouts, the periodic term explanations, assigned chapters in the textbook, and the study questions for assigned readings/web sites/videos.

- **Review Question Assignments (5% of course grade):** To ensure that you are watching the lecture videos in a timely fashion, every week you will submit one essay-style review question designed to test a student's knowledge of an important topic covered in the last 3 lecture recordings that were assigned. In addition, you must also submit a thorough answer (one you'd expect from an 'A' student) for the question that can fit on a single sheet of paper. Copying a question and answer from another student is not acceptable and will result in a grade of zero for the assignment. Your review questions and associated answers will be due before midnight on the dates given on the syllabus and are to **be sent by email to the instructor as an attached PDF document**.
- **"In the News" Assignments (5% of course grade):** To increase your awareness of the current issues & concerns related to global ecology, every week you will submit a link to on-line news articles (**not opinion pieces**) from **reputable news outlets** that addresses an issue related to the **science** of global ecology, along with a short summary (must be 8-10 sentences) that includes **the main point(s)** being made by the article, **and** an explanation for **why the article is newsworthy**. Your summary should be **expressed in your own words and direct quotations should not be used**. These assignments will be submitted by email to the instructor before midnight on the dates indicated on the syllabus.

- **Term Explanation Assignments (10% of course grade):** To help you keep up with the course material and to better prepare you for the exams, you will periodically (~ weekly) be given 4-5 terms to identify & explain as specifically as possible in the context of global ecology (i.e., what are they and **why are they important?**). You should use the information in the course materials (lectures, readings, etc.), but all **answers must be expressed your own words**. Copying material from a source or from another student is not acceptable and will result in a grade of zero for the assignment. Your answers to these questions will be due before midnight on the dates given on the syllabus and are to **be sent by email to the instructor as an attached PDF document**.
- **Homework Assignments (5% of course grade):** During the semester there will be four homework assignments. The due dates are noted on the syllabus. These are intended to expose you to some quantitative aspects of global ecology. You are expected to work individually on these assignments but are welcome to ask me questions. Your **answers must show all work** and should be **sent by email to the instructor as a single, well-organized, PDF file** before midnight on the dates indicated on the syllabus.
- **Attendance (5% of course grade):** Since we are meeting in person once a week, your attendance is required. More than one unexcused absence after the first week of classes will result in no credit being awarded for attendance. One or fewer unexcused absences will result in full credit being awarded for attendance.

Course Grades: Letter grades are assigned at the end of the course. Grades are based on the total number of points accumulated by the end of the semester and are determined using the following scale:

Grade	Percentage
A	100-90
B	89-80
C	79-70
D	69-60
F	59-0

Grading: For all graded materials: Excellent work will be awarded $\geq 90\%$ of points; Good work will be awarded 80-90% of points; Satisfactory work will be awarded 70-80% of points; Unsatisfactory work will be awarded $< 70\%$ of points; Missing work will receive no points

Late assignments: The grade for any late assignment will be reduced by 10% for every day after the deadline.

WVU Course Policies: For the policies that govern all WVU courses, please see <https://tlcommons.wvu.edu/syllabus-policies-and-statements> with special attention to:

- The Academic Integrity Statement
- Academic Standards Policy
- Adverse Weather Statement
- COVID-19 Statement
- Inclusivity Statement
- Sale of Course Material Statement

Syllabus: This syllabus is issued for the convenience of the student and does not constitute a contract between the student and the instructor. The instructor reserves the right to change the syllabus at any time during the semester.

Syllabus for Global Ecology Spring 2024

Date	Lect. #	Topic	Chapter
April	8* [?]	35	2
	10	36	
	12 ^{#+}	37	
	15* [?]	38	12 & 14
	17	39	
	19 [#]	40	
	22* [?]	41	
	24	42	15 (pgs. 301-320)
	26 ^{#+}		Our Changing Climate: Causes, Consequences, & Challenges (<i>In-Class Meeting</i>)
May	2	<i>Final Exam (2-4 PM)</i>	16

[?]Indicates that your review question and answer are due before midnight.

*Indicates that answers to term explanations are due before midnight.

+Indicates that answers to homework assignments (i.e., problem sets) are due before midnight.

#Indicates that an "In the News Assignment" is due before midnight.