

Biogeography: Global Patterns of Life
GEOG/ENVST 3270/5270 - 001 4 credit hours
SPRING SEMESTER 2021 SYLLABUS

Class Meetings: 10:45 - 12:05 PM Tuesday and Thursday via Zoom

Lab Meetings: Thursday 12:55-1:45 PM *or* 2:00-2:50 PM via zoom

- **Instructor:** Mitchell Power
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Teaching Assistant: Jaydee Dolinar

TA E-mail: CANVAS

Instructor office hours: 11:00-12:00 AM Monday; 12:15-1:15 PM Tu & Th or by appointment

TA office hours: Tuesday & Thursday, 12:10-12:50 PM; Wednesday 12:00-2:00 PM or by appointment

Required Text: *Biogeography: Space, Time, and Life* by Glen M. MacDonald, John Wiley & Sons, Inc., New York 2003. ISBN: 0471241938. There will be assigned papers. These readings are accessible through the Canvas website for this course. Also, you can find lecture notes and other important resources on Canvas.

Zoom lectures and electronic distractions during class: Please practice being present during the lecture. Class participation is required to be successful and the best way to participate is to listen and ask questions. We are only in lecture for 2 hours and 40 minutes per week, which leaves you with over 165 hours per week to check your phone and respond to other digital needs, please do that outside of lecture time. We will do our best to schedule safe, in-person class meetings as the semester progresses following the recommendations of our health officials.

Course Description

GEOG 3270/5270 - Biogeography: Global Patterns of Life. Recommended prerequisite: GEOG 1000. Fulfills *Comm/Wrtg* and *Phys/Life Sci* Exploration. Biogeography is concerned with the living planet. In particular, biogeographers are interested in global patterns of life. Student discussions focus on important biogeographical topics, such as biodiversity, conservation, the evolution of life and the impacts of global change to life on our planet. One field trip. *Graduate students should enroll in GEOG 5270 and are held to a higher standard and/or more work.*

Introduction

This course takes a detailed look at the present-day distribution of all life forms on Earth and examines the factors that have led to this distribution, in particular, plate tectonics, climate change, and human disturbance. We will review the most recent techniques used by biogeographers. A basic understanding of biology (botany, zoology, mammalogy) is required, and the lectures and discussions will assume that the class possesses such knowledge. If you are a bit rusty on some of these concepts (e.g. photosynthesis, plate tectonics, etc. for example), please put your well-practiced internet research skills to use!

Course Objectives and Suggestions

There are four main objectives for this course. 1) to provide students with an overview of the scientific method, including how data are collected, hypotheses developed, and theories tested, 2) to provide students with a

strong foundation and understanding of the most recent theories and methodologies in biogeography, 3) to enhance the ability of students to read and critically evaluate scientific literature, and 4) to improve students' abilities to express clearly and concisely, both orally and in writing, their scientific findings and their evaluations of others scientific ideas.

To succeed in this class (or any other science course you may take), I make the following suggestions: 1) take notes! 2) study the figures (in the book, on Powerpoints, in the journal articles), annotate them, and make your own versions, 3) use the timelines/syllabus schedule provided and 4) check Canvas for announcements and information.

C/W Course Requirements

This course fulfills the University of Utah Upper Division Communication/Writing Courses (C/W) requirement, as well as the Physical and Life Sciences area (S/F) requirement. The Undergraduate Handbook states: *"This requirement prepares students to speak and write clearly within the standards of practice set by the discipline. It provides students advanced instruction in speaking and writing so that those skills continue to develop throughout the educational program. It may be fulfilled by taking an approved upper-division communication/writing course identified by the student's major department. Courses in the Physical, life, and Applied Sciences area introduce students to the ways in which scientists, engineers, and scholars in scientifically-based technical fields gain knowledge and understanding. They illustrate the interplay between observation, theory, experiment, deduction and application. The connection between scientific and technological progress and the moral and ethical foundations of society are studied when appropriate."* To meet the criteria delineated for these standards, the following requirements must be met by all students in the laboratory section of this class:

- (a) Three written critiques of scientific research
- (b) Scientific presentation and discussion of a research article
- (c) Research poster project and presentation
- (d) Course participation

(a) Critiques: The Instructor will lead a discussion and evaluation of a scientific paper at the beginning of the course (Jan. 14). Students will be required to read this scientific paper, and it will serve as the basis for **both** Critique 1 and Critique 2.

Critique 1 will have several components to familiarize students with the structure of a formal critique. The critique outline will be due Jan. 30 submitted on Canvas. The students will be required to bring a COMPLETE DRAFT of Critique 1 to the lab the following week (Feb. 11) for peer review. The final draft of Critique 1 will be due on Feb. 25.

Critique 2 is a **major** revision of Critique 1 and must address the problems and deficiencies identified in the evaluation of Critique 1 provided to the student. The final draft is due March 18.

Critique 3 will be a critique of the selected research article chosen during the second week of class from the list provided by the Instructor. These research articles will also serve as a basis for the presentation/discussion leader assignment discussed below. A COMPLETE DRAFT of Critique 3 will be due on March 25 for peer review. The final draft of Critique 3 is due on April 15.

(b) Scientific Presentation/Discussion of a Research Article: After learning how to write a critique, each student will work in a group of three (3) people for the presentation/discussion assignment (note, if you are in 5270 this assignment will be done on an individual basis). The group will select a research article from the list provided by the instructor. Each group (those registered for 3270) will present a brief (15 minutes) presentation on the article. For individuals (those registered for 5270) will present a brief (10 minutes) presentation on the article. In the lab,

a detailed presentation guideline will be provided. All presentations will be done using PowerPoint during your assigned lab. It will be the responsibility of the presenting group to stimulate a 10-minute discussion, and part of the grade will be based on the success of the discussion.

(c) Research Posters: Students are expected to produce a professional-quality research poster on a given topic by the end of the semester. The **objective** of the poster is to provide a comprehensive analysis and synthetic discussion about the group's research topic that is substantively supported by outside (peer-reviewed) research. Students will submit a list of topics, which will include recent and controversial topics in biogeography. The instructors will select a topic from the list of top choices for each group (3270) or individual (5270) and assign the topics accordingly. Students will work in groups and topics will be selected by the third week of the semester. Instructions on how to prepare the poster using Powerpoint or Google Docs and deadlines are provided during lab classes. This group assignment consists of four (4) progressive parts, which will be explained in detail during lab.

(d) Participation: The success of this course is largely dependent on student participation. Students will get far more out of this class if they read the assigned articles, think critically about the papers discussed, and actively participate in class and lab. A small part of each student's final grade will be based on their participation during lectures and labs.

Species Collage

Part of your participation grade will be a backyard species collage. You are to take a picture of one species per week (plant/animal) and figure out its *Genus* and *species*. This will amount to 12 labeled images. At the end of the course you will compile the pictures into a Species Collage of My Backyard. If you do not have a backyard you may choose a suitable area of land to observe about the size of a common backyard.

Course Grading

Final grades are earned on the basis of the overall accumulated points. There will be unannounced quizzes, two equally weighted exams, and a few short in-class exercises focused on data evaluation. These exercises are intended for you to gain experience in the operation of the scientific method and how data are used to develop biogeographic theories. Details of these exercises will be provided in the weeks to come.

Mid-Term Exam and Final Exam: Two equally-weighted exams will be given to evaluate students' knowledge of biogeographic concepts. The final will be over new material, and not comprehensive.

If for any reason you cannot submit work at the designated time, you must contact Mitchell Power **before** the date due. **I DO NOT ACCEPT LATE WORK** and you may receive an "E" grade for the work. Call or email to leave a message if an emergency comes up. **I DO NOT ACCEPT EXTRA CREDIT WORK UNDER ANY CIRCUMSTANCES. I reserve the right to submit any piece of written work to Turnitin.com.**

% Grade Breakdown

Grading for <u>GEOG 3270</u> will be based on the following:		Grading for <u>Geog 5270</u> will be based on the following:	
• Written scientific paper critiques (3 total)	25%	• Written scientific paper critiques (3 total)	25%
• Presentation/Discussion assignment- <i>group</i>	10%	• Presentation/Discussion Assignment - <i>individual</i>	10%
• Participation	5%	• Participation	5%
• Poster- final <i>group</i>	15%	• Poster- final <i>individual</i>	15%
• Poster outline	5%	• Poster outline	5%
• Poster text	10%	• Poster text	10%
• Quizzes (best 5 count)	5%	• Quizzes (best 5 count)	5%
• <u>Class exercises</u>	5%	• Class exercises	5%
• Mid-term exam	10%	• Mid-term exam	10%
• <u>Final exam</u>	10%	• <u>Final exam</u>	10%
Total	100%	Total	100%

Assignment	Due Date	
Exercise 001; Overview of Presentation/Discussion Assignment	Jan. 21	
Bring Part B of presentation assignment (bring to lecture)	Jan. 26	
Instructor led discussion on Critique 1 article (in lecture)	Jan. 26	
Three (individual) article choices due	Jan. 28	
Exercise 002: Summary	Jan. 28	
Critique 1 outline	Feb. 4	
Three poster topic choices for group project	Feb. 4	
Critique 1 draft due	Feb. 11	
Overview of Group Poster/Presentation Assignment	Feb. 11	
Critique 1 Peer Review Due	Feb 18	
Critique 1 Due	Feb. 25	
Poster Outline (including Title & References)	Mar. 4	
Critique 2 draft due	Mar. 11	
Mid-Term Exam (in lecture)	Mar. 16	
Critique 2 Due	Mar. 18	
Poster mock gallery draft due	Mar. 18	
Mock Poster Gallery (Attendance Required)	Mar. 25	
Exercise 003: Editor Roles Assignment	Mar. 25	
Critique 3 draft due	Mar. 25	
Critique 3 Peer Review Due; Implement Editor roles edits to poster	Apr. 1	
Critique 3 Peer Review Revision submitted for TA critique	Apr. 8	
Critique 3 due; Final Posters due	Apr. 15	
Poster critique and presentation session in lecture	Apr. 22	
Exam (in lecture)	TBD	

“Island biogeography is no longer an offshore enterprise. It has come to the mainlands. It’s everywhere. The problem of habitat fragmentation and of the animal and plant populations left marooned within the various fragments under circumstances that are untenable for the long term, has begun showing up all over the land surface of the planet. The familiar questions recur. How large? How many? How long can they survive?”

David Quammen (1996) *The Song of the Dodo*

Tentative Semester Schedule

DAY	DATE	DISCUSSION TOPIC	READINGS
T	1/19	<i>Introduction to Biogeography and scientific method</i>	Syllabus, notes
TH	1/21	<i>History of Biogeography</i>	Chap. 1
<p>LAB 1 (Jan. 21)</p> <ul style="list-style-type: none"> - Topic (a): Lab objectives and overview of lab assignments - Topic (b): Overview of Presentation/Discussion assignment - Read: Keane et al., 2006 (by Jan. 26) - Submit: Exercise 001 (by midnight) - Assignment: Select three article choices (by Jan. 28) - Assignment: Part B of Critique #1 (by Jan 26, bring to lecture) 			

T	1/26	<i>Biogeography basics: Biological & Physical distribution of life</i> * Instructor led discussion of Critique 1 article	Chap. 2 & Chap. 3
TH	1/28	<i>Biotic & Abiotic Controls on the Distribution of Life</i>	Chap. 3
<p>LAB 2 (Jan. 28)</p> <ul style="list-style-type: none"> - Topic: Critique 1 using a three-part essay organizer; outline template - Submit: (a) Select individual article presentation order (in lab), (b) Select three articles (from provided choices) for presentation/discussion assignment (by midnight), (c) write paragraph for each article (by midnight) - Submit: Exercise 002 - Keane et al., 2006 article summary (by midnight) - Submit: Select groups for presentation/poster project (by end of lab) - Assignment: Select top 3 article selection w/members (due Feb 4th) - Assignment: Critique 1 outline (due Feb 4) - Assignment: Presenters (on Feb 4) complete "Part A" of Presentation/Discussion assignment - Assignment: Non-presenters read articles before lab; complete "Part B" (submit before Feb 4) 			

T	2/2	<i>Distribution of Life</i>	Chap 4
TH	2/4	<i>Distribution of life II</i>	Chap. 4
<p>Lab 3 (Feb 4)</p> <ul style="list-style-type: none"> - Topic: Doing research and using search engines. - Submit: Group selection of top 3 presentation/discussion articles (by midnight) - Submit: Critique #1 outline (by midnight) - Submit: Three poster topics for group presentation/poster (by midnight) - Assignment: Critique 1 draft (due Feb 11) - Assignment: Presenters (on Feb 11) complete "Part A" of Presentation/Discussion assignment - Assignment: Non-presenters read articles before lab; complete "Part B" (submit before Feb 11) 			

T	2/9	<i>Natural Disturbance</i>	Chap. 5
TH	2/11	<i>Disturbance</i>	Chap. 5
<p>LAB 4 (Feb 11)</p> <ul style="list-style-type: none"> - Topic: Detailed overview of group poster assignment - Submit: Critique 1 draft (due by midnight) - Assignment: Begin Critique 1 peer review (due Feb 18) 			

- Assignment: Presenters (on Feb 18) complete “Part A” of Presentation/Discussion assignment
- Assignment: Non-presenters read articles before lab; complete “Part B” (submit before Feb 18)

T 2/16 *Communities, formations, biomes* Chap. 6

TH 2/18 *Biomes cont.* Chap. 6

LAB 5 (Feb. 18)

- Topic: Overview of group poster assignment
- Submit: Critique #1 Peer Review (by midnight)
- Assignment: Complete Critique #1 final draft (due Feb 25)
- Assignment: Work on group poster outline, include title and references (due Mar. 4)
- Assignment: Presenters (on Feb 25) complete “Part A” of Presentation/Discussion assignment
- Assignment: Non-presenters read articles before lab; complete “Part B” (submit before Feb 25)

T 2/23 *Changing continents & climates* Chap. 7

TH 2/25 *Tectonics and Paleoclimate cont.* Chap. 7

LAB 6 (Feb. 25)

- Topic: Student presentations/discussions
- Submit: Final Draft of Critique 1 (by midnight)
- Assignment: Begin Critique #2 – a major revision of Critique #1 (due Mar 11)
- Assignment: Continue work on group poster outline, include title and reference (due Mar. 4)
- Assignment: Presenters (on Mar 4) complete “Part A” of Presentation/Discussion assignment
- Assignment: Non-presenters read articles before lab; complete “Part B” (submit before Mar 4)

T 3/2 *Paleoclimate* *Reading assigned*

TH 3/4 *Dispersal, colonization, invasion* Chap. 8

Lab 7 (Mar 4)

- Topic: Student presentation/discussion
- Submit: Group poster outline (by midnight)
- Submit: Exercise 003 (by midnight)
- Assignment: Continue work on Critique #2 (due Mar 11)
- Assignment: Continue work on group poster (draft due Mar 18)
- Assignment: Presenters (on Mar 11) complete “Part A” of Presentation/Discussion assignment
- Assignment: Non-presenters read articles before lab; complete “Part B” (submit before Mar 11)

T 3/9 **Field Trip** to Natural History Museum of Utah -

TH 3/11 *Evolution, speciation, & extinction* Chap. 9

LAB 8 (Mar 11)

- Topic: Student presentation/discussion
 - Submit: Critique #2 draft (due by midnight)
 - Assignment: Continue work on group poster (draft due Mar 18)
 - Assignment: Presenters (on Mar 18) complete “Part A” of Presentation/Discussion assignment
 - Assignment: Non-presenters read articles before lab; complete “Part B” (submit before Mar 18)
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T	3/16	<i>Evolution, speciation, & extinction- cont.</i>	Chap. 9
TH	3/18	MID-TERM EXAM	
		LAB 9 (March 18)	
		- Topic: Student presentation/discussion	
		- Review: Discuss overall Critique 1 comments	
		- Submit: Critique #2 final draft due (by midnight)	
		- Submit: Group poster rough draft (by midnight)	
		- Assignment: Begin work on Critique #3 (draft due Mar 25)	
		- Assignment: Presenters (on Mar 25) complete "Part A" of Presentation/Discussion assignment	
		- Assignment: Non-presenters read articles before lab; complete "Part B" (submit before Mar 25)	
F	3/12	-----LAST DAY TO WITHDRAW FROM CLASSES-----	

T	3/23	<i>6th Extinction Crisis</i>	<i>Assigned reading</i>
TH	3/25	<i>Biogeographic subdivisions</i>	Chap. 10
		LAB 10 (March 25)	
		- Topic: Student presentation/discussion	
		- Submit: Critique #3 draft (by midnight)	
		- Submit: Group poster draft (by midnight/final due Apr 8)	
		- Submit: Exercise 003: Editor roles assignment	
		- Assignment: Critique #3 Peer Review (due Apr 1)	
		- Assignment: Prepare for mock poster gallery (in lab) (Apr 1)	
		- Assignment: Implement changes per chosen editor role to group poster (Apr 1)	
		- Assignment: Presenters (on Apr 1) complete "Part A" of Presentation/Discussion assignment	
		- Assignment: Non-presenters read articles before lab; complete "Part B" (submit before Apr 1)	

T	3/30	<i>Migration and dispersal</i>	assigned reading
TH	4/1	<i>Dispersal</i>	assigned reading
		LAB 9 (Apr 1)	
		- Topic (a): Student presentation/discussion	
		- Topic (b): Poster Design (formatting, images, columns, and tips)	
		- Submit: Critique 3 peer review (by midnight)	
		- Submit: Group poster editor roles draft (by midnight)	
		- Assignment: Presenters (on Apr 8) complete "Part A" of Presentation/Discussion assignment	
		- Assignment: Non-presenters read articles before lab; complete "Part B" (submit before Apr 8)	

T	4/6	<i>Human evolution</i>	Chap. 11
TH	4/8	<i>Humans as a force in evolution/ extinction</i>	Chap. 12
		LAB 10 (April 8)	
		- Topic: Student presentation/discussion	
		- Assignment: Group poster final draft (due Apr 15)	
		- Assignment: TA Review of Critique #3	
		- Assignment: Presenters (on Apr 15) complete "Part A" of Presentation/Discussion assignment	
		- Assignment: Non-presenters read articles before lab; complete "Part B" (submit before Apr 15)	

T 4/13 *Description & interpretation of distributions* Chap. 13

TH 4/15 *Island Biogeography* Chap. 14

- LAB 11 (April 15)**
- Topic: Student presentation/discussion **if needed**
- Submit: Final group posters (by midnight)
- Submit: Critique #3 (by midnight)
- Assignment: Presenters (on Apr 22) complete "Part A" of Presentation/Discussion assignment
- Assignment: Non-presenters read articles before lab; complete "Part B" (submit before Apr 22)

T 4/20 *Island Biogeography* Chap. 14
TH 4/22 *Conservation & Future Change* Chap. 15

- LAB 12 (April 22)**
- Topic: Poster Presentations
- Submit: Group poster critiques (by midnight)
- Submit: Group poster presentations (in lab)

T 4/27 *Student Poster presentations*

TBD **FINAL EXAM: date and time TBD**, exam will occur in our class room.

University of Utah Attendance Policy

The University expects regular attendance at all class meetings. **You are not automatically dropped from your classes if you do not attend.** You must officially drop your classes by the published deadline to avoid a "W" on your record.

You are responsible for satisfying the entire range of academic objectives, requirements and prerequisites as defined by the instructor. If you miss the first 2 class meetings, or if you have not taken the appropriate requisites, you may be required to withdraw from the course.

If you are absent from class to participate in officially sanctioned University activities (e.g. band, debate, student government, intercollegiate athletics), religious obligations, or with instructors approval, you will be permitted to make up both assignments and examinations.

University of Utah Standards of Academic Conduct

All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from and class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.

Academic Misconduct Handbook Statement

* Academic misconduct will not be tolerated. Penalties may include failure of an assignment, the entire course, and/or the filing of formal charges with appropriate university authorities. Academic misconduct includes, but is not limited to, cheating, misrepresenting one's work, and plagiarism:

* Cheating involves the unauthorized possession or use of information in an academic exercise, including unauthorized communication with another person during an exercise such as an examination.

* Misrepresenting one's work includes, but is not limited to, representing material prepared by another as one's own work or submitting the same work in more than one course without prior permission of all instructors.

* Plagiarism means the intentional unacknowledged use or incorporation of any other person's work in one's own work offered for academic consideration or public presentation. **(I reserve the right to submit any piece of written work to Turnitin.com).**

University of Utah Center for Disability Services

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.