

# Biogeography

Biogeography deals with the spatial distribution of the planet's plants and animals over time, as well as the physical forces that impact them. Among others, biogeography draws from climatology, and ecology, to better understand the distributions and diverseness of the planet's organisms. The study of biogeography seeks to better understand distributions of species, and connections to the physical landscapes, as well as how humans influence these processes. Students will utilize local, and remote resources to better understand process such as speciation, adaptation, and the effects of change.



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**Teacher Websites:**

Semester 1 –

[Mrtredinnick.com/biogeography](http://Mrtredinnick.com/biogeography)

Semester 2-

[mrtredinnick.com/ecological-biogeography](http://mrtredinnick.com/ecological-biogeography)

**Term:** Fall 22- Spring 23

**Meeting Time:** MW2 & TH3

Second semester continues with the topics of speciation and biodiversity from the biogeography course, and examines the patterns of adaptations and variations that occur across different ecosystems and at different latitudes. The emphasis of the course will be on the animal and plant adaptations and specializations that species have made to survive in different environments. Students will incorporate topics from biology, botany, and zoology under a geographic framework to better understand the connections that plants and animals have with the environment they live in. Using project-based methods of observation, data collection, and geospatial modeling, students will incorporate in scientific studies to better understand spatial distributions of the planets plants and animals.

I. **Course Objectives**

- a. **Field Work:** Get students looking at real life examples around them, and through using data from actual scientific projects to develop a better understanding of the world.
- b. **Theoretical Understanding:** Develop a working knowledge of how the geographic process is used to develop and test a theory that better explains the world.
- c. **Practical Application:** Expand an understanding of the theories through the actual practice of biogeography
- d. **Research:** Work through the research process to develop an idea within the geographic framework.

**II. Readings and Study Materials:**

*Biogeography: Biological Diversity across Space and Time, ISBN 13: 978-1605354729, 5th Edition, 2016*

*Song of the Dodo: Island Biogeography in the Age of Extinction, David Quammen, 1997*

*Darwin's Armada: Four Voyages and the Battle for the Theory of Evolution, Iain McCalman, 2010*

*Additional Readings and resources will be used throughout the course of the semester*

**III. Unit Overviews:**

a. Unit I – Physical Geography (4 Weeks)

To build up the foundations of the study of biogeography students need a foundation of study in physical geography. Students will be introduced to concepts from related fields such as climatology and earth science, that will be relevant in the following units. Time will also be taken to establish course procedures and expectations for the coming year to allow for the maximization of instructional time.

b. Unit II – Principles of Biogeography (8 Weeks)

Building off the fundamental concepts from unit I, Unit II goes more in depth into the principles of Biogeography. Developing the foundations of students understanding by examining the core concepts. This unit is will build knowledge on the fundamental concepts of biogeography and the methods used to examine species distribution.

c. Unit III – Applied Biogeography (4 Weeks)

Students will be conducting two “field” studies in order to apply their knowledge from Units I and II by conducting a sampling survey of native species on campus grounds, and constructing a panbiogeographic model of a species of their choice. The first project will have students design and conduct a research inventory of native species in a survey area, as an example of larger scale operations. The second project will be on a broader scale, where students will select an animal of their choosing and construct a geospatial model of their current range to determine area of origin.

-Semester Break-

d. Unit IV – Concepts of Ecogeography (5 Weeks)

Students will be compiling knowledge through the first units into a larger conceptual understanding of ecology and the ways that plants and animals interact with one another. Ideas such as human and climactic influences will be introduced in the context of understanding how they can affect base earth systems and, in-turn, species distributions.

e. Unit V – Floral and Faunal Adaptations (8 Weeks)

Using available resources (such as geospatial resources, and the zoo) students will be examining the unique biomes that exist around the world and the specific challenges that plants and animals face in those areas. Students will split time between classroom instruction involving geoinquiry still studies, and field-based studies using the resource of the zoo to examine habitats and animal adaptations found in different ecosystems.

f. Unit VI – Human Ecology (5 Weeks)

As a caveat to the student understanding of ecology, the incorporation of human elements will be examined as it pertains to the potential changes in the environment. The unit will focus on ways that humans have affected the environment over space and time. The capstone of the unit – along with a unit test – will be successful completion of an Environmental Impact Statement where they will explain the potential environmental impacts of the building of a coal plant, and then have to make a suggestion for an alternative.

\*This schedule is tentative and subject to change

**IV. Grading Procedures:**

- a. Redoing/Revising Coursework: Students are allowed redos and revisions of coursework for full credit during that unit of study. Scores for student work after retaking, revising or redoing will not be averaged with the first attempt at coursework or assessment but will replace the original student score.
- b. Late Coursework: Students are expected to complete missing coursework. Late coursework is accepted for full credit until the end of the unit. Once late coursework is turned in, the zero will be replaced with the score earned by the student. Late work completed during the unit of study will not result in a reduction in grade. Work that is not turned in during the unit of study will receive a reduced score.
- c. Missing Coursework: Work not turned in at all will receive a score of M. An M is weighted the same as a zero in the gradebook. Students have until the end of the unit to hand in any missing assignments. Accommodations due to extended illnesses are to be arranged with the teacher.

**V. Grading Scale**

Zoo Academy
Summative: 65%
Formative: 35%
A = 100% - 90%
B = 89% - 80%
C = 79% - 70%
D = 69% – 60%
F = 59% - 0%



**VI. Course Requirements:**

Daily Warm-Ups: Each day of the class students will be required to do daily warm-up questions from the class forum that can be found at the bottom of the course website or by using the following link <https://www.mrtredinnick.com/biogeography-forum>. These daily forums will have questions to help connect the materials that will be covered in the day’s lesson to the students’ own personal preconceptions or ideas.

Homework: Homework will be frequently used to accentuate and build upon concepts covered in class. Homework assignments themselves will NOT be graded. Instead, student comprehension of the concepts from the homework will be included in daily quizzes that will also assess students' learning from the lectures, discussions, activities, etc.. These daily quizzes will make up 100% of the formative grade for this class.

Tests/Quizzes: Tests will be taken in class on a designated date. If a student is unable to complete the test during the testing time due to illness or other factors it is the student's responsibility to communicate with the instructor to come up with alternate arrangements for the test.

**VII. Academic Dishonesty/Cheating**

Any students caught cheating, or attempting to cheat, will be given an automatic zero on the assignment. Further action may be taken depending on the situation.

**VIII. Targeted Learning Standards**

**SS 12.3.1** Students will analyze where (spatial) and why people, places, and environments are organized on the Earth's surface.

**SS 12.3.2** Students will examine how regions form and change over time.

**SS 12.3.3** Students will interpret how natural processes interact to create the natural environment.

**SS 12.3.5** Students will evaluate interrelationships between people and the environment

**SS 12.3.6** Students will analyze issues and/or events using the geographic knowledge and skills to make informed decisions.