Department of Geography & Geoinformation Science

GGS 321-001 | BIOL 374-001 [Hybrid] Fall 2020
Biogeography: Space, Time, and Life

Name	:	Maction Komwa, PhD	Meeting Times	:	TR | 1:30 pm – 2:45 pm
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Virtual Office hours: Tuesdays and Thursdays: 3:00 pm - 4:00 pm or by appointment.

Courser Description:

A survey of the relationship between distribution of plants and animals on the earth surface and the physical geography and environmental characteristics. Limited to three attempts.

Recommended Prerequisite: GGS 122 or permission of instructor.

Required Textbooks:

Lomolino M.V., B.R. Riddle, R.J. Whittaker, and J.H. Brown. 2016.
Biogeography: Biological diversity across space and time, 5th edition.
Published by Sinauer Associates is an imprint of Oxford University Press
ISBN 10: 0878934944 ISBN 13: 9780878934942

David Quammen. The Song of the Dodo: Island Biogeography in an Age of Extinction. Scribner, 1997

Course overview

The science of biogeography is one of the most interdisciplinary endeavors as it links the disciplines of ecology, biology, and geography. The core principles of biogeography are to (i) document the distribution of plants, animals, and microbes on the surface of the Earth and (ii) understand the processes that contribute to the variable patterns in distribution of biota. The former principle is a re-visitation of the tools and methodologies employed by naturalists and the subsequent products that they produce. The second principle, the more mechanistic initiative, is the one that is interdisciplinary as the distribution of each biome, community, species and population reflects a unique combination of factors based on biology (e.g., inherent growth and physiology), geography (e.g., role of disparate landscape types in controlling dispersal and migration), and ecology (e.g., interactions among competing species). An added incentive to understand biogeography is the resurgence in a host of applied issues that require biogeographical skills and knowledge, including climate change, conservation of species, invasive species, evolution, biodiversity, and land use planning.

Learning Outcomes

By the end of the course, you will be able to:

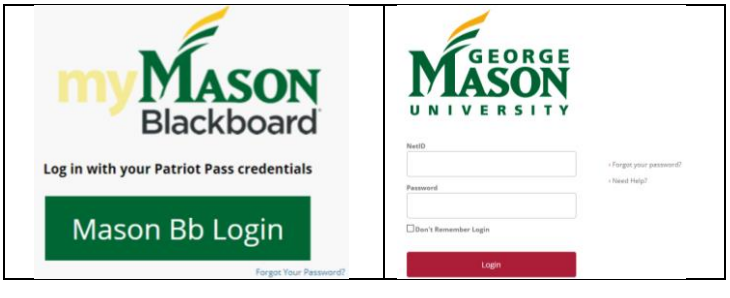
- develop a broad understanding of how physical geography and the environment influence distribution of plants and animals on the earth's surface.
- understand the linkages between patterns and processes across a range of spatial and temporal scales.
- provide critical understanding of key concepts related to ecological and historical biogeography.
- develop a framework for understanding how the issues evolved and the consequences for science and policy.
- learn how humans affect geographic patterns of biodiversity
- apply GIS techniques to investigate spatial patterns of species, biomes, and ecosystems.
- Identify, examine, and assess the scientific literature relating to biogeography.

Instructional Methodology

- This is a hybrid course meaning – an instructional delivery method which combines the face to face delivery and guided distance delivery formats. During the face-to-face instruction time, students can be engaged in realistic, collaborative learning experiences. Learners and faculty will meet in person or as a group for regularly scheduled class sessions either in their assigned classroom for the semester or at another physical location based on the scheduled topic to be discussed.
- The online modules instruction and interaction will be delivered via electronic communication, correspondence, or equivalent mechanisms, such as multimedia-enhanced content, Blackboard Ultra Collaborate/Webex with faculty and learners physically separated from each other. In this kind of approach, students can interact with course content independently or asynchronously online while collaborating and applying key concepts within the synchronous classroom.
- The course will have 8 required "Discussion Meetings/Face-to-face" (see course schedule below). This means two of our campus meetings will be designated for Mid Term Exams and Final Exams.

Technology Requirements

- As a student participating in this hybrid course, or considering taking this type of course, it is expected that you have the following:
    - Internet Connection
        - Access to high speed connection such as Cable, DSL, or Satellite is recommended
            - Internet Browser Support include:
                - Internet Explorer latest version
                - Safari version latest version
                - Google Chrome latest version
                - Firefox latest version
    - Learning Management Systems
        - Blackboard is our course management system which provides access to course materials, assignments, and class discussions. You will log in to Blackboard using your George Mason username and password through this link: https://mymasonportal.gmu.edu.



        - If you have computer problems, please contact ITS Support Center httpp://itservices.gmu.edu; Email: support@gmu.edu; | Phone: 703-993-8870.
    - Access to software
        - You will need to have access to the most up to date:
            - Adobe Acrobat Reader. https://get.adobe.com/reader/;
            - Windows Media Player: https://windows.microsoft.com/enus/windows/downloads/ windows-media-player/
            - Apple Quick Time Player: www.apple.com/quicktime/download/
            - MS Word, Excel, etc.
    - Self-direction, motivation, time management and online communication skills.
    - Participate in online course discussion during the week throughout the semester.
- If you do not have the above basic requirements of skills, your success in this course may be impacted.

- Required equipment necessary for this course thus including hardware and software (e.g. MS word, etc.), speakers, microphones, or webcams, etc. are the responsibility of the student.

Course Communication

- Students are required to regularly check their George Mason email/Blackboard for announcements or updates related to the course.
- All students are expected to use their George Mason email account for all course communication. I will not acknowledge any email that is sent through other platforms.
- You should feel free to send me email if you have any questions regarding something that you do not understand. Although I will not instantly answer your e-mail, I will reply to your e-mail within 24-48 hours and if you don't get my response please feel free to remind me or ask to confirm if I have received your email.
- Please do not wait until the day of the work is due to ask questions.

Course Expectations:

Students are expected to (i) read selected background chapters from the text by MacDonald, (ii) participate in classroom discussions,(iii) provide one bi-weekly research report from the peer-reviewed literature that relates to the topic under discussion, (iv) complete lab assignments, (v) provide a critical analysis of a select issue in biogeography (of the student's own choosing) demonstrating student's ability to evaluate the scientific basis for the issue. Finally provide a written research manuscript (~10 pages) and an oral presentation (~8minutes).

Course Assignments and Grading Breakdown

Students are expected to submit high quality assignments during this course via the Blackboard. All assignments are to be completed according the dates outlined in the syllabus.

Course Assignment Requirements Description	Percentage (%)
Discussion Forum	5%
Bi-Weekly Reflection Summary	15%
Class Discussion Leaders	2.5%
Lab assignment and GIS Application	5%
Exam 1	15%
Mid Term Exam	20%
Research Paper	25%
Research Paper Presentations	10%
Peer-Review	2.5%

Grades will be assigned based on the distribution scheme below

Range	Letter Grade	Grade description	Range	Letter Grade	Grade description
93 -	A	Excellent	77 - 79	C+	Above satisfactory
90 - 92	A-	Very Good	70 - 76	C	Unsatisfactory
87 - 89	B+	Good with merit	60 - 69	D	Unsatisfactory
83 - 86	B	Good	<60	F	Failure
80 - 82	B-	Above satisfactory			

Discussion Forums

Class discussion is an important part of any college experience. You will have a structured opportunity to interact with each other through guided questions related to class topics. This will consist of your posting followed by comments or response, questions on your classmate's posting. Your contribution will be rated according to the scientific content, critical thinking and concept application based on the following criteria:

- *Unacceptable (0 points); poor (1 point); good (2 points) and excellent (3 points). Full a rubric, check the Blackboard.*
- *Each Discussion topic will have instructions on how to write and submit the posting and your response. Absolutely, no make-up will be given for Discussion Forum.*

Labs:

Students will work with spatial data using ArcGIS and species database to map the distribution of plants and animals on the earth surface. The GIS technique applications can be used to help ask and answer spatial questions (e.g. why plants and animals live where they do and how they respond to environmental changes). These labs are designed to give students skills that will add additional information to the field of Biogeography. Students will also be able to answer spatial questions related to distribution of species. Additionally, the labs will provide you a platform to experience with some of the most common activities Biogeographers perform. In addition to using ArcMap, you will familiarize yourself with an open source Maxent program for maximum entropy modelling of species' geographic distributions (https://biodiversityinformatics.amnh.org/open_source/maxent/)

Class Discussion Leaders:

During the semester, you will lead a discussion on a topic assigned by the instructor from the readings of that week. This will be the opportunity for you to apply newly learned skills from the topic under discussion, learn to analyze arguments critically, practice synthesizing conflicting views, or relate material to your own life experience. Discussion leaders will formulate three to five questions pertaining to the subject matter. A variety of question types such as exploratory, cause and effect, analytical, action, and hypothetical should be created. More importantly, the questions should challenge the class to deepen their understanding of the issue under discussion. The questions should include page references to the reading assignment, and they must be submitted by 5pm the evening before your assigned class period. Points will be deducted for not adhering to the instructions.

After the discussion, the discussion leaders will have the responsibility to write up a set of answers to their reading questions, then provide a summary of the class discussion. The summary report should be about 650-700 words in length.

Exams

There will be 2 Exams [Exam 1 and Mid-Term Exam]. The exam will be mostly objective in nature with questions that will allow students to analyze, apply, and synthesize lecture, videos and homework concepts and reading material. Exam may include multiple-choice, true-false, matching, fill-in the blank, and short answer questions. Exam will be taken in one of our face-to-face class meetings.

Final Research Paper

A literature review on the biogeography of a species or genus of your choosing. Papers should be 10 pages of double-spaced, times new roman 12-point text, plus additional pages for works cited in APA style and illustrations. Must include in-text citations for at least ten peer-reviewed scientific journal articles, plus at least one map and one photo. All research paper topics should be approved by the Instructor. As part of continuous assessment, and improving the quality of your research paper, all papers will be peer-reviewed by one of your classmates before final submission. Instructions will be provided and will be posted through the Blackboard.

Reflection Summary | Homework

The homework assignments designed to give students hands-on experience with the collection, analysis, and interpretation of biogeographic datasets. Ultimately, this will help students practice their writing skills as you prepare for your final research paper. This assignment will be mixed bag throughout the semester: For example, summary of a research or news article; reading reflection, etc. will be completed.

Policy on Late Submissions and Quizzes, Assignments

Please do not wait until the last minute **(11:59 pm – Eastern Time)** for you to complete your assignment - computers are machines and sometimes they cannot be reliable (e.g. power outage, wireless connection problem etc.) and cannot be held accountable for your excuse. This means, late assignment will be penalized - 5 points will be deducted from their possible score for each day they are late. We will work so hard to turn your assignments in a timely manner and, it is much easier when you turn your assignments to us on time.

All students are expected to:

- Review the course material and follow the course calendar.
- Work at full pace to avoid missing class activities.
- Be active participants in discussion forum throughout the course period.
- Communicate with you instructor to ask for help or clarification of an assignment or class activities.
- Respect the privacy of other classmates and the instructor in this virtual classroom.
- Re-read your responses in the discussion forum carefully before postings them.
- Express differences of opinion in a polite and sensible way.
- Keep an open mind to the constructive criticism from classmates and use it to improve your work.
    - We are in this class to share information and learning from each other.
    - By sharing and discussing each other's ideas, you will be able to examine your own thoughts and feelings hence, making the course interesting and enjoyable!
- Use good grammar and spelling in all your assignments and discussions.
- Write your messages in formal language.

Academic Integrity

George Mason University operates under an honor system, which is published in the University Catalog and deals specifically with cheating, attempted cheating, plagiarism, lying, and stealing. You are therefore expected to take this course in adherence to GMU and Department standards for Academic Integrity. Please familiarize yourself with the honor code, especially the statement on plagiarism (http://www.gmu.edu/org/honorcouncil/guidelines.htm). I will respond to acts of academic misconduct according to university policy concerning plagiarism. In such cases Plagiarism will result in a failing grade of the assignment in question and/or for the course.

Plagiarism and the Honor Code

It is expected that students adhere to the George Mason University Honor Code as it relates to integrity regarding coursework and grades: To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University Community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this Honor Code: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work. More information about the Honor Code, including definitions of cheating, lying, and plagiarism, can be found at the Office of Academic Integrity website at http://oai.gmu.edu.

Plagiarism checking services

To guard against plagiarism, written work will be checked against existing published materials. Accordingly, all materials for this course are required to be submitted electronically through Blackboard. Frequently used plagiarism detection services include: SafeAssign. If you have any questions about identifying possible plagiarism in your own work, including proper referencing practice, contact the University Writing Center http://writingcenter.gmu.edu/ or your Instructor.

Students with Disabilities

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474.

GMU Nondiscrimination Policy:

George Mason University is committed to providing equal opportunity and an educational and work environment free from any discrimination on the basis of race, color, religion, national origin, sex, disability, veteran status, sexual orientation, gender identity, age, marital status, pregnancy status, or genetic information. George Mason University shall adhere to all applicable state and federal equal opportunity/affirmative action statutes and regulations.

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a "Responsible Employee," and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1412. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (703-380-1434) or Counseling and Psychological Services (CAPS) (703-993-2380). You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730 or emailing cde@gmu.edu.

Student Support Services

George Mason University has several academic support and other resources to facilitate your success. Some of these resources are presented below:

i. Counseling and Psychological Services: http://caps.gmu.edu/
ii. Learning Services, University Career Services: http://careers.gmu.edu/
iii. The Writing Center [http://writingcenter.gmu.edu/
iv. University Catalog: http://catalog.gmu.edu/
v. University Policies: http://universitypolicy.gmu.edu

Withdraw from a course

If for some reasons you decide not to continue with this course, students should follow the official GMU procedures and policies of course withdraw. By informing the instructor your intention to withdraw from the course or by just stop attending - "NOT SUFFICIENT" for GMU to accept the withdraw from the course. If you name still appears on the official roster for the class and you have earned a "0" grade, you will get "F" as your final grade.

Course Calendar: *Faculty reserves the right to alter the schedule as necessary, with notification to students.*

Week	Date	Code	Lecture and Lab Topics	Readings
Week 1	8/25		Course Begins – Discuss course schedule and syllabus	
			INTRODUCTION TO THE DISCIPLINE	
	8/27		Chapter 1. The Science of Biogeography	Chapter 1
Week 2	9/1		Introduction to ArcGIS • *Discussion Forum # 1 due*	Article/Data Bb
	9/3		Chapter 2: History of biogeography	Chapter 2
Week 3	9/8		Chapter 2: History of biogeography & Article Discussion • *Reading Reflection Summary #1 due*	Chapter 2
			THE GEOGRAPHIC AND ECOLOGICAL FOUNDATIONS OF BIOGEOGRAPHY	
	9/10		Chapter 4. Distributions of Species | The tree adaptations data collection • *Research Topic due*	Chapter 4
Week 4	9/15		Chapter 4: Distributions of species • *Discussion Forum # 2 due*	Chapter 4
	9/17		Lab application on distribution of species – ArcGIS	Article/Data Bb
Week 5	9/22		**Exam 1**	
	9/24		Chapter 5: Distributions and communities • *Reading Reflection Summary #2 due*	Chapter 5
Week 6	9/29		Chapter 5: Distributions and communities • *Research Topic description [Paragraph and Preliminary Bibliography due]*	Chapter 5
	10/1		Mapping Communities: Compositional and Functional Approaches • *Discussion Forum # 3 due*	
			BIOGEOGRAPHIC PROCESSES AND EARTH HISTORY	
Week 7	10/6		Chapter 6: Dispersal and immigration	Chapter 6
	10/8		Chapter 6: Dispersal and immigration • *Reading Reflection Summary #3 due*	Chapter 6
Week 8	10/13		No class meeting	
	10/15		Species "invasions" – Paper Discussion | Invasive species lab • *Discussion Forum # 4 due*	Article on the Bb
Week 9	10/20		**Mid-Term Exam**	
	10/22		Chapter 7. Speciation and Extinction • *Reading Reflection Summary #4 due*	Chapter 7
Week 10	10/27		Chapter 7. Speciation and Extinction	Chapter 7
	10/29		Extinctions shape diversity – Paper Discussion • *Discussion Forum # 5 due*	Article on the Bb
Week 11	11/3		Chapter 9. Glaciation and Biogeographic Dynamics of the Pleistocene *Discussion Forum # 6 due*	Chapter 9
	11/5		Chapter 9. Glaciation and Biogeographic Dynamics of the Pleistocene *Draft - Research Paper due*	Chapter 9
			ECOLOGICAL BIOGEOGRAPHY	
Week 12	11/10		Chapter 13. Island Biogeography | Species richness on an island Data collection	Chapter 13
	11/12		Chapter 13. Island Biogeography • *Reading Reflection Summary #5 due*	Chapter 13 Article/Data Bb
Week 13	11/17		The Song of the Dodo: Island Biogeography – Book Discussion	David Quammen Textbook
			CONSERVATION AND THE FRONTIERS OF BIOGEOGRAPHY	
	11/19		Chapter 15. Biogeography of Humanity, Biological Diversity, and Conservation	Chapter 15
Week 14	11/24		Chapter 15. Biogeography of Humanity, Biological Diversity, and Conservation • *Peer-Review due*	Chapter 15
	11/26		*No class Happy Thanksgiving*	
Week 15	12/1		Chapter 16: From the Foundations to the Frontiers of Biogeography	Chapter 16
	12/3		Post your Recorded Presentation through the Blackboard | Volunteers Can Present f2f or through WebEx Conference	
Week 16	12/6		*Final Paper due*	
CODE Interpretation			Face to Face Meeting or this can change to synchronous if necessary | Online instructions | Synchronous Meeting	