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### Course Syllabus - Spring 2024

9.30 – 10.50 T/Th - NHB 2083

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#### Course Description

Biogeography deals with spatial and temporal patterns of biological diversity and the factors that govern the distribution and abundance of taxa. This course will address two of its subfields: historical biogeography – the origin, dispersal, and extinction of taxa and biotas; and ecological biogeography – the role physical and biotic environments play in determining taxonomic distributions. We will explore the ecological, evolutionary, climatological, and paleontological foundations for the distribution of species and biological communities. The course will review many of the field's classic papers, the current synthesis of biogeographic theory, and the application of biogeography to conservation.

#### Course Goals

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

- Describe the historical and ecological factors which influence the pattern of life on earth
- Explain how advances in paleontology, climatology, evolution, plate tectonics, molecular systematics, and ecology have shaped the modern synthesis of biogeography
- Apply the scientific method and philosophy of hypothesis testing to biogeographic problems
- Evaluate modern conservation and mitigation strategies using biogeographic theory

A second set of goals relate to your development as a successful life-long learner; these include developing the abilities to:

- Evaluate your own knowledge and skills
- Analyze and interpret the primary scientific literature
- Communicate scientific arguments through written and oral work
- Work collaboratively

#### Prerequisites

This course is intended for juniors, seniors, and graduate students with prior coursework in biology. Enrollment is restricted to students who have taken IB 150 (Organismal & Evolutionary Biology) or have completed equivalent coursework. Additional coursework in Ecology (IB 203), Evolution (IB 302), and Genetics (IB 204) or their equivalents is strongly recommended. Students without this preparation should anticipate devoting additional time each week to independently reviewing fundamental concepts to keep up with the reading and assignments.

## Instructor

Dr. Surangi W. Punyasena  
Associate Professor, Plant Biology; Affiliate: Geology; Geography; Illinois Informatics Institute  
Email: [spunya1@illinois.edu](mailto:spunya1@illinois.edu)  
Office and hours: By appointment

## Course Website and Communication

Course assignments, readings, the current syllabus, and Zoom links for online participation are posted on the Learn@Illinois site: <https://learn.illinois.edu/course/view.php?id=64422>

You will need your NetID and password to gain access. Updates to the course will be announced in lecture and as announcements on Learn@Illinois. Please contact me if you have any problems accessing the website.

Official University e-mail addresses are used for course communications. Please note that you are expected to check your university issued e-mail account regularly and act on any communications received. Due to privacy restrictions, I may not be able to respond to e-mail messages sent from non-University e-mail accounts.

## Course Structure

We meet twice a week for 80 minutes. **Tuesdays** are structured as a lecture and class discussion of the week's topic. The anticipated lecture schedule is listed at the end of this document. PDFs of lecture slides will be available on the Learn@Illinois website the morning before class. All lectures will be live-streamed and recorded. **Thursdays** are structured around paper discussions. Attendance and participation in the Thursday discussion is graded. My hope is to provide a virtual option for all discussions as well. The final weeks of class will be student presentations.

## Assigned Reading

Reading assignments serve two purposes. They provide context and background to the material covered in Tuesday lectures and they are the source of content for Thursday discussions. They will be listed on the Learn@Illinois course website.

Readings will be taken from peer-reviewed literature and our texts:

*Biogeography, Fifth Edition* (2017) [**Required**]

Mark V. Lomolino, Brett R. Riddle, and Robert J. Whittaker  
Sinauer Associates  
ISBN-13: 978-1605354729  
ISBN-10: 1605354724

*Foundations of Biogeography: Classic Papers with Commentaries* (2004) [**Recommended**]

MV Lomolino, DF Sax, and JH Brown (editors)  
University Of Chicago Press  
ISBN-13: 978-0226492377  
ISBN-10: 0226492370

The books are available for purchase at the university bookstore and are on reserve at **Funk ACES Library**. We use the Lomolino et al. textbook extensively in this class. The *Foundations* text is used for a limited number of assigned papers and in the final project. Sections of the book are also available online through [Google Books](#).

## The Learning Environment

Our classroom is an inclusive, collaborative environment for focused learning. A fundamental expectation is that you treat your classmates with respect. Disruptive behavior, including unauthorized use of phones and computers, is not permitted. You will be asked to use your laptop or a tablet for class assignments but will be asked to stop all non-lecture-related uses (social media, texting, web surfing, completing homework, etc.) Anyone violating this policy will first be given a warning, and then asked to leave class, forfeiting any credit for in-class assignments.

## Online Pre-Lecture Assignments

The eleven weekly pre-lecture assignments are meant to help prepare you for the week's lecture and discussion. They will include 5-10 short answer questions and must be completed by Monday 11:55 pm to receive credit.

## Lecture Responses (Extra Credit)

We will have an optional 5-minute weekly lecture response at the end of every Tuesday lecture, where you will reflect on what you learned and ask questions. This response must be turned in using the course website by Tuesday 11:55 pm.

## Thursday Discussions

Our Thursday classes focus on the reading of the primary scientific literature. Each week, you are responsible for an in-depth reading of a classic or contemporary journal article. You will need to submit two discussion questions based on the week's reading by Wednesday 11:55 pm. I will select a subset of questions for class discussion. In class, you will be assigned to a discussion group and have 40 minutes to discuss the posted questions and post your group responses. We will then discuss your responses as a class. Questions and responses will be graded based on an online rubric for thoughtfulness and thoroughness. Questions selected for discussion will receive extra credit. You will need to bring a laptop or an alternative device capable of connecting to the Learn@Illinois website. You may miss one discussion without penalty.

## Midterm and Final Exams

There are two written exams. Both will have an online short essay, which will be open-book, and an in-person short answer portion, which will be closed-book.

## Final Project

The final presentations are designed to evaluate your literacy and depth of knowledge of biogeography. If you have trouble getting started, please arrange to speak with me well in advance of the due dates!

### ***Paper selection – Due February 1***

Review the papers compiled in the *Foundations of Biogeography: Classic Papers with Commentaries*. Do not choose a paper at random. not covered in class.

### ***Prospectus – Due February 8***

The presentation prospectus will get you thinking about the final project early in the semester. The prospectus should be 3-5 pages double-spaced. In it you should:

- Identify the major biogeographic themes identified by that paper
- List the complete citation for 5 or more recent peer-reviewed journal articles that help define where this biogeographic subfield is today
- Include context and explanation for these five papers

### **Presentation outline – Due March 7**

The presentation outline is intended to demonstrate the progress you have made in developing a unified presentation of your ideas. It should be 3-5 pages double-spaced. If we have more than 33 students in the class, you may elect to work in pairs. In the outline, you should:

- Identify the *Foundations* paper that you will present
- List the biogeographic themes from the paper you will explore further
- Provide a bibliography of at least 5 recent peer-reviewed journal articles that you are reviewing for the presentation
- Outline the major arguments you will make in your presentation

You will receive feedback following spring break.

### **Class presentation – Due April 15**

I have reserved the last three weeks of class for group presentations. Presentations should be 8 minutes in length with 2 minutes for questions. A copy of your bibliography should also be turned in online at this time. Presentations will be evaluated based on the following criteria:

- Thoroughness of the bibliographic research presented
- Originality of ideas
- Quality of the presentation and degree of preparation (slides and speech)
- Ability to answer questions from your peers

### **Grading and Assignment Values**

Grading is on a 1000-point scale, with points distributed as follows:

Midterm	140
Final	150
Pre-lecture assignments (11, @20 points each)	220
Discussion questions (11, @15 points each, lowest dropped)	150
Discussion responses (11, @10 points each, lowest dropped)	100
Presentation prospectus	50
Presentation outline	50
Presentation	100
Presentation feedback (15 points per day)	40
Extra Credit: Lecture feedback submitted, 3 points per week	33
Extra Credit: Discussion questions selected, 3 points per week	33

Letter grades will be assigned according to an absolute scale.

A+	>970 points	C+	770-799 points
A	930-969 points	C	730-769 points
A-	900-929 points	C-	700-729 points
B+	870-899 points	D+	670-699 points
B	830-869 points	D	630-669 points
B-	800-829 points	D-	600-629 points
		F	0-599 points

Questions regarding grading should be raised within one week of the grades being uploaded to the Learn@Illinois gradebook. It is your responsibility to review your grades on a regular basis.

## Late Assignments and Absences

Assignment deadlines are coordinated with in-class activities. Therefore, late assignments and make-up exams will only be allowed in the case of excused absences (e.g., an absence letter from the Office of the Dean of Students (<https://odos.illinois.edu/community-of-care/resources/students/absence-letters/>)). Pre-lecture activities may be turned in late only with instructor permission. Paper summaries will be requested in lieu of missed pre-discussion forum questions.

## Request for Special Accommodations

Disability Resources and Educational Services (DRES) provides students with academic accommodations, access, and support services. To contact DRES, visit 1207 S. Oak St., Champaign, call 217-333-1970, e-mail [disability@illinois.edu](mailto:disability@illinois.edu) or go to the DRES website at <https://dres.illinois.edu/>. Information on applying for DRES services are available here: <https://dres.illinois.edu/information-before-you-apply/application-process/>.

To obtain disability-related academic adjustments and/or auxiliary aids, students must provide the instructor with a Letter of Academic Accommodations from DRES. Students who require assistance should apply for DRES services and speak with the instructor as soon as possible. Note that exams at alternate facilities should be arranged at a time within 24 hours of the regularly scheduled exam.

## Academic Integrity

All students are assumed to have read and understood the University of Illinois Student Code, (<https://studentcode.illinois.edu/>) and will be expected to act accordingly. Please review the code carefully as it outlines your rights and responsibilities as a student at this university. Violations will be reported using the FAIR system. Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: <https://studentcode.illinois.edu/article1/part4/1-401/>. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

## Course Copyright

The content of the syllabus, lectures, and other class materials (including multimedia) for this course is copyrighted. External material is used with permission from the original sources or under fair-use guidelines. All content is intended for the private use of students enrolled in IB 407 and may not be reproduced without the written permission of Dr. Punyasena. This includes the uploading and sharing of course material on public or for-profit websites. Unauthorized distribution of copyrighted materials may violate federal law and/or the University of Illinois Student Code, (<https://studentcode.illinois.edu/>).

## Mental Health

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you. If you are in immediate danger, call 911.

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255
- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

This statement is approved by the University of Illinois Counseling Center

## Community of Care

As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regards to their well-being or yours, we encourage you to refer this behavior to the Student Assistance Center (217-333-0050 or <http://odos.illinois.edu/community-of-care/referral/>). Based on your report, the staff in the Student Assistance Center reaches out to students to make sure they have the support they need to be healthy and safe.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the [Student Assistance Center \(SAC\)](#) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

## Disruptive Behavior

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office for Student Conflict Resolution (<https://conflictresolution.illinois.edu>; [conflictresolution@illinois.edu](mailto:conflictresolution@illinois.edu); 217-333-3680) for disciplinary action.

## Emergency Response Recommendations

Emergency response recommendations and campus building floor plans can be found at the following website: <https://police.illinois.edu/em/run-hide-fight/>. Please review this website within the first 10 days of class.

## Religious Observances

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. Students should complete the [Request for Accommodation for Religious Observances form](#) should any instructors require an absence letter in order to manage the absence. In order to best facilitate planning and communication between students and faculty, students should make requests for absence letters as early as possible in the semester in which the request applies.

## Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: [wecare.illinois.edu/resources/students/#confidential](http://wecare.illinois.edu/resources/students/#confidential).

Other information about resources and reporting is available here: [wecare.illinois.edu](http://wecare.illinois.edu).

## Anticipated Lecture and Discussion Schedule

Updates to the lecture, discussion, and exam schedules will be announced in lecture and as course announcements on Learn@Illinois

Week 1: What is Biogeography?		
Tu 16-Jan	Lecture 1	Species in space and time <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 18-Jan	Paper Discussion	Fundamental patterns in biogeography <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 2: The Geographic Range		
Tu 23-Jan	Lecture 2	Physical and biotic controls of the species range <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 25-Jan	Paper Discussion	Conceptualizing the range <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 3: The Niche		
Tu 30-Jan	Lecture 3	Defining the niche <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 01-Feb	Paper Discussion	The niche in space and time <i>Pre-discussion assignment due Wed 11:55 pm</i> <b>PAPER SELECTION DUE Thurs 11:55 pm</b>
Week 4: Dispersal and Migration		
Tu 06-Feb	Lecture 4	Dispersal and migration <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 08-Feb	Paper Discussion	Species "invasions" <i>Pre-discussion assignment due Wed 11:55 pm</i> <b>PRESENTATION PROSPECTUS DUE Thurs 11:55 pm</b>
Week 5: Evolution, Niche, and the Geographic Range		
Tu 13-Feb	Lecture 5	The geographic context of evolution <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 15-Feb	Paper Discussion	Endemism patterns are scale dependent <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 6: The Evolutionary Signature of Biogeographic History		
Tu 20-Feb	Lecture 6	Genetic reconstructions of migration and isolation (phylogeography) <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 22-Feb	Paper Discussion	Refugia past and present <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 7: Midterm Exam		
Tu 27-Feb	MIDTERM EXAM – Pt 1 Short Answer (in class)	
Th 29-Feb	MIDTERM EXAM – Pt 2 Online Essay (no class, due Thursday 11:55pm)	
Week 8: Vicariance versus Dispersal		
Tu 05-Mar	Lecture 7	The fundamental debate of historical biogeography <i>Pre-lecture assignment due Mon 11:55 pm</i>

Th 07-Mar	Paper Discussion	Darwin's rafts and Hooker's bridges <i>Pre-discussion assignment due Wed 11:55 pm</i> <b>PRESENTATION OUTLINE DUE Thursday 11:55 pm</b>
Week 9: Spring Break		
Tu 12-Mar	No Classes	
Th 14-Mar		
Week 10: Extinction and the Geographic Range		
Tu 19-Mar	Lecture 8	Extinction shapes geographic range – geographic range shapes extinction <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 21-Mar	Paper Discussion	Megafaunal extinctions <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 11: The Biogeography of Islands		
Tu 26-Mar	Lecture 9	Islands and the balance of diversity <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 28-Mar	Paper Discussion	Island biogeography and conservation <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 12: Biomes and Communities		
Tu 02-Apr	Lecture 10	Community assembly (Clements, Gleason, and modern syntheses) <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 04-Apr	Paper Discussion	Community assembly and invasive species <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 13: Conservation Biogeography		
Tu 09-Apr	Lecture 11	Land use and human impacts <i>Pre-lecture assignment due Mon 11:55 pm</i>
Th 11-Apr	Paper Discussion	Habitat loss <i>Pre-discussion assignment due Wed 11:55 pm</i>
Week 14: Final presentations		
Tu 16-Apr	Presentations 1 - 8 <b>PRESENTATIONS DUE Monday 11:55 pm</b>	
Th 18-Apr	Presentations 9 - 16	
Week 15: Final presentations		
Tu 23-Apr	Presentations 17 - 24	
Th 25-Apr	Presentations 25 - 32	
Week 16: Final exam		
Tu 30-Apr	FINAL EXAM – Pt 1 Short Answer ( <b>in class</b> )	
W 01-May	FINAL EXAM – Pt 2 Online Essay ( <b>due Wednesday 11:55pm</b> )	