

BI395: Tropical Ecology
Tue & Thu 12:00 – 1:20; TYKE 32



Instructors:

Dr. Krista McGuire (Assoc. Professor; she/her)

Virtual office hours: Wed 1:00-3:00 or by appointment using this zoom link:

<https://uoregon.zoom.us/j/99456200642>

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Max Spencer (Ph.D. student; he/they)

Office hours: Mon 2:00-3:00 (Straub 258)

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Monika Ruwaimana (Ph.D. student; she/her)

Office hours: Fri 2:00–3:00 (Pacific 217)

mruwaima@uoregon.edu

Required Materials:

Textbook: Corlett & Primack. 2011. *Tropical Rain Forests: An Ecological and Biogeographical Comparison* (2nd ed.)

*readings from this book are abbreviated as CP in the schedule below

*note: the U of O library has full access to the electronic version of this book

Clickers: You are required to purchase a clicker for this course, which will be used for every lecture that we have on campus

Course Description: In the tropical ecology course you will learn about the unique ecosystems that occur near and around the equator. The focus of the course will be on lowland tropical rain forests, which contain nearly 80% of all plant and animal species despite the fact that they only comprise ~6% of the land surface of the planet. We will go into depth about the contemporary and historical ecological processes that generate and maintain this incredible reservoir of diversity. Topics include biogeography and the latitudinal gradient of diversity, tropical climate and soils, origins of tropical ecosystems, causes and consequences of tropical deforestation, as well as unique ecological patterns and processes specific to the major tropical regions (Neotropics, African, and Asian tropics). For each class, students read primary literature articles pertaining to the lecture topic in addition to a reading from the course textbook. The class format is a combination of lectures and discussions with two in-class exams and a final exam, and written assignments due in each discussion.

Learning Objectives:

Students who complete this course will be able to:

1. Apply general ecological principles to tropical ecosystems
 2. Articulate the ecological and evolutionary mechanisms that shape tropical diversity patterns
 3. Identify the biogeographical patterns of plants, mammals, and insects across the tropics
 4. Read, synthesize, and analyze primary scientific literature
 5. Understand the major threats to tropical ecosystems and how the application of ecological principles can facilitate conservation efforts
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Grading: Total of 500 points for course

⇒ 3 exams

- Exam 1 (100 pts; 20% of grade)
- Exam 2 (100 pts; 20% of grade)
- Final Exam (150 pts; 30% of grade)

⇒ 10 homework assignments (10 pts each; 100 pts total; 20% of grade)

⇒ Participation in discussion section; assessed with attendance (50 pts; 10% of grade)

⇒ Grading will follow the guidelines of: A (93-100%), A- (90-92%), B+ (87-89%), B (83-86%), B- (80-82%), C+ (77-79%), C (73-76%), C- (70-72%), D+ (67-69%), D (63-66%), D- (60-62%), F (0-59%). A+ grades will not be assigned in this course.

⇒ Exam grades will be determined as follows: the highest grade on the exam will be raised to 100% and all other exams will have points added in the same proportion. For example, if the highest scoring exam is 95/100 then that exam will earn 100/100 and all other exams will have 5 points added to the final score.

⇒ Homework assignments consist of 5-10 questions related to the primary literature articles assigned for that week of lectures. Generally, there are 5 questions for each article. Responses to questions should be short (bulleted lists are accepted), but need to be paraphrased and written in your own words. Copying and pasting text from the article will result in earning 0 points for the assignment. Participation will be calculated by attendance in discussion, participating in conversations during discussion, and clicker responses during lecture.

Special needs: Please notify me in the first week of the course if you have special needs or a documented disability that will interfere with your ability to perform course activities.

Estimated Student Workload: Lectures are 1.5 hours twice per week and there are 18 lecture periods during the term (30 hours total). There are also 10 discussion sections that meet for 1 hour per week (27 hours total). Assigned readings are estimated to take approximately three hours per class plus time for discussion preparation (10 hours per week, 50 hours total). There is one written homework assignment each week that should take approximately 3 hours per assignment (30 hours total). There are also 2 in-class exams (1 hour 20 minutes each) plus a final exam (2 hours).

Week	Date	Topic	Reading	Assignment due in Discussion
1	29-Mar	Lecture01: Ecology as a discipline; Tropical climate and soils	CP1 (pg 9-17)	
	31-Mar	Lecture02: Tropical ecosystem types and distribution	Bond & Parr 2010; CP1 (pg 1-9)	HW1
2	5-Apr	Lecture03: Studying tropical diversity	Anderson-Teixeira et al. 2015	
	7-Apr	Lecture04: Why are tropical forests so diverse? Part I: Deterministic theories	Wright 2002	HW2
3	12-Apr	Lecture05: Why are tropical forests so diverse? Part 2: Neutral theory	Wennekes et al. 2012	

	14-Apr	Lecture06: Mutualisms	Arnold et al. 2003	HW3
4	19-Apr	Exam 1		
	21-Apr	Lecture07: Tropical floristics	Pitman et al. 2001; CP2	HW4
5	26-Apr	Lecture08: Tropical insects	Becerra 2015; CP7	
	28-Apr	Lecture09: Trait-based ecology	Esquivel-Muelbert et al. 2019	HW5
6	3-May	Lecture10: Tropical mammals	Kurten et al. 2015; CP3 (pg 76-93; 97-101); CP4 (pg 102-112; 120-122)	
	5-May	Tropical primates: lemurs (movie)	CP3 (pg 93-97)	HW6
7	10-May	Lecture11: Amazonia & the Guiana Shield	McMichael et al. 2017	
	12-May	Lecture12: Central America & the Caribbean	Uriarte et al. 2019	HW7
8	17-May	Exam 2		
	19-May	No class (complete assignment)	Blake et al. 2009	HW8
9	24-May	Lecture13: African tropics	Wilcove et al. 2013	
	26-May	Lecture14: Southeast Asia & Australia	Shearman & Bryan 2011; CP5 (pg 156-159)	HW9
10	31-May	Lecture15: Tropical agroecosystems & ethnobotany	Perfecto et al. 2014	
	2-Jun	Lecture16: The future of tropical forests	CP9; Fayle et al. 2015	HW10
	7-Jun	Final Exam 8AM – 10AM		

Reading list bibliography

**You are responsible for finding these articles on ISI Web of Science, downloading them, and reading them prior to each class*

- Anderson-Teixeira, K. J., S. J. Davies, A. C. Bennett, E. B. Gonzalez-Akre, H. C. Muller-Landau, S. J. Wright, et. al. 2015. 'CTFS-ForestGEO: a worldwide network monitoring forests in an era of global change', *Global Change Biology*, 21: 528-49.
- Arnold, A. E., L. C. Mejia, D. Kyllö, E. I. Rojas, Z. Maynard, N. Robbins, and E. A. Herre. 2003. 'Fungal endophytes limit pathogen damage in a tropical tree', *Proceedings of the National Academy of Sciences of the United States of America*, 100: 15649-54.

- Becerra, J. X. 2015. 'On the factors that promote the diversity of herbivorous insects and plants in tropical forests', *Proceedings of the National Academy of Sciences of the United States of America*, 112: 6098-103.
- Blake, S., S. L. Deem, E. Mossimbo, F. Maisels, and P. Walsh. 2009. 'Forest Elephants: Tree Planters of the Congo', *Biotropica*, 41: 459-68.
- Bond, W. J., and C. L. Parr. 2010. 'Beyond the forest edge: Ecology, diversity and conservation of the grassy biomes', *Biological Conservation*, 143: 2395-404.
- Esquivel-Muelbert, A., T. R. Baker, K. G. Dexter, S. L. Lewis, R. J. W. Brienen, T. R. Feldpausch, J. Lloyd, et. al. 2019. 'Compositional response of Amazon forests to climate change', *Global Change Biology*, 25: 39-56.
- Fayle, T. M., E. C. Turner, Y. Basset, R. M. Ewers, G. Reynolds, and V. Novotny. 2015. 'Whole-ecosystem experimental manipulations of tropical forests', *Trends in Ecology & Evolution*, 30: 334-46.
- Kurten, E. L., S. J. Wright, and W. P. Carson. 2015. 'Hunting alters seedling functional trait composition in a Neotropical forest', *Ecology*, 96: 1923-32.
- McMichael, C. N. H., F. Matthews-Bird, W. Farfan-Rios, and K. J. Feeley. 2017. 'Ancient human disturbances may be skewing our understanding of Amazonian forests', *Proceedings of the National Academy of Sciences of the United States of America*, 114: 522-27.
- Perfecto, I., J. Vandermeer, and S. M. Philpott. 2014. 'Complex ecological interactions in the coffee agroecosystem', *Annual Review of Ecology, Evolution, and Systematics*, 45: 137-58.
- Pitman, N. C. A., J. W. Terborgh, M. R. Silman, P. Nunez, D. A. Neill, C. E. Ceron, W. A. Palacios, and M. Aulestia. 2001. 'Dominance and distribution of tree species in upper Amazonian terra firme forests', *Ecology*, 82: 2101-17.
- Shearman, P., and J. Bryan. 2011. 'A bioregional analysis of the distribution of rainforest cover, deforestation and degradation in Papua New Guinea', *Austral Ecology*, 36: 9-24.
- Uriarte, María, Jill Thompson, and Jess K. Zimmerman. 2019. 'Hurricane María tripled stem breaks and doubled tree mortality relative to other major storms', *Nature Communications*, 10: 1362.
- Wennekes, Paul L., James Rosindell, and Rampal S. Etienne. 2012. 'The Neutral—niche debate: a philosophical perspective', *Acta Biotheoretica*, 60: 257-71.
- Wilcove, D. S., X. Giam, D. P. Edwards, B. Fisher, and L. P. Koh. 2013. 'Navjot's nightmare revisited: logging, agriculture, and biodiversity in Southeast Asia', *Trends in Ecology & Evolution*, 28: 531-40.
- Wright, S. J. 2002. 'Plant diversity in tropical forests: a review of mechanisms of species coexistence', *Oecologia*, 130: 1-14.

Campus resources to support your learning

Tutoring and Academic Engagement Center (<https://engage.uoregon.edu/>) Drop-in math and writing support in addition to tutoring, study skills support, and Class Encore. Located in the 4th Floor Knight Library (541) 346-3226, engage@uoregon.edu.

Counseling Center Call anytime to speak with a therapist who can provide support and connect you with resources. Located on the 2nd Floor of the Health Center(541)346-3227

Accessible Education Center The University of Oregon is working to create inclusive learning environments. The instructor believes strongly in creating inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify us as soon as possible. You are also encouraged to contact the Accessible Education Center. If you are not a student with a documented disability, but you would like for us to know about class issues that will impact your ability to learn, we encourage you to come visit during office hours so that we can strategize how you can get the most out of this course. Located on the 1st Floor of Oregon Hall (541) 346-1155, uoaec@uoregon.edu

Center for Multicultural Academic Excellence (CMAE) mission is to promote student retention and persistence for historically underrepresented and underserved populations. We develop and implement programs and services that support retention, academic excellence, and success at the UO and beyond. We reaffirm our commitment to all students, including undocumented and tuition equity students. Located on the 1st Floor of Oregon Hall (541) 346-3479, cmace@uoregon.edu

The *UO Access Shuttle* is an on-campus ride service provided at no cost to students with conditions that limit mobility. More information and a sign-up form can be found on the parking & transportation department website: <https://parking.uoregon.edu/content/access-shuttle>.

Class Courtesy

Please arrive in class on time. Late arrivals distract the instructor and the other students. Please turn off cell phones during the class meeting times. Use your laptop only for class activities. Do not leave class early unless you have cleared it with the instructor in advance. Ask questions if you did not hear or understand something.

Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter (or before) so that I may address you properly.

Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities. Classroom courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Our classroom is a learning environment, and as such should be a safe, inclusive and respectful place. Being respectful also includes using preferred pronouns for your classmates. Disrespecting fellow students as well as combative approaches, tones and/or actions are not acceptable. Please make me aware if there are classroom dynamics that impede your (or someone else's) full engagement.

Academic integrity

All students will be expected to adhere to the University's guidelines on academic integrity as outlined in the Student Conduct Code: <https://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>. As detailed in the policy, academic misconduct means the violation of university policy involving academic integrity. This includes cheating ("any act of deception by which a student misrepresents or misleadingly demonstrates that the student has mastered information on an academic exercise that the student has not mastered"), and plagiarism ("using the ideas or writings of another as one's own.") The instructor has a **zero-tolerance** policy for academic dishonesty. All persons

involved in academic dishonesty will be disciplined in accordance with University regulations and procedures.

Discrimination and Harassment

Prohibited Discrimination and Harassment

Any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment may seek resources and help at safe.uoregon.edu. To get help by phone, a student can also call either the UO's 24-hour hotline at 541-346-7244 [SAFE], or the non-confidential Title IX Coordinator at 541-346-8136. From the SAFE website, students may also connect to Callisto, a confidential, third-party reporting site that is not a part of the university.

Students experiencing any other form of prohibited discrimination or harassment can find information at respect.uoregon.edu or aaeo.uoregon.edu or contact the non-confidential AAEO office at 541-346-3123 or the Dean of Students Office at 541-346-3216 for help. As UO policy has different reporting requirements based on the nature of the reported harassment or discrimination, additional information about reporting requirements for discrimination or harassment unrelated to sexual assault, relationship violence, sex or gender based bullying, stalking, and/or sexual harassment is available at [Discrimination & Harassment](#).

Reporting

The instructor of this class is a Student-Directed Employee. As such, **if you disclose to me, I will respond to you with respect and kindness. I will listen to you, and will be sensitive to your needs and desires. I will not judge you. I will support you.** As part of that support, I will direct students who disclose sexual harassment or sexual violence to resources that can help. **I will only report the information shared to the university administration when you as the student requests that the information be reported** (unless someone is in imminent risk of serious harm or is a minor). Please note the difference between 'privacy' and 'confidentiality.' As a Student-Directed Employee I can offer privacy because I am not required to report certain information to the university. However, I cannot be bound by confidentiality in the same way that a counselor or attorney is. Confidential resources such as these means that information shared is protected by federal and state laws. Any information that I as a student-directed employee receive may still be accessed by university or court proceedings. This means, for example, that I could still be called as a witness or required to turn over any related documents or notes that I keep.

Please note also that I am required to report all other forms of prohibited discrimination or harassment to the university administration. Specific details about confidentiality of information and reporting obligations of employees can be found at titleix.uoregon.edu.

Mandatory Reporting of Child Abuse

UO employees, including faculty, staff, and GEs, are mandatory reporters of child abuse. Child abuse pertains to individuals who are under the age of 18. This statement is to advise you that your disclosure of information about child abuse to the instructor may trigger my duty to report that information to the designated authorities. Please refer to the following links for detailed information about mandatory reporting: [Mandatory Reporting of Child Abuse and Neglect](#).

Safe Ride

541-346-7433 ext 2

pages.uoregon.edu/saferide

Safe Ride is an **assault prevention shuttle** that works to provide free, inclusive, and accessible alternatives to traveling alone at night for **UO students, faculty, and staff**.

We are a schedule-ahead service and riders can (1) call once we open to schedule a ride with a dispatcher or (2) leave a voicemail on the day of their ride request. We do not call riders ahead of time to confirm due to capacity constraints, but riders are always welcome to call us to double-check that their

ride was scheduled. We are a feminist, 'for-the-students/by-the-students' organization and operate out of the Women's Center in EMU 12F.

Operating hours:

Spring term Sunday - Thursday | 7p - midnight

Friday + Saturday | 7p - 2a

Summer term Sunday - Thursday | 9p - midnight

Friday + Saturday | 9p - 2a

Fall/Winter term Sunday - Thursday | 6p - midnight

Friday + Saturday | 6p - 2a

Policy and rules:

1. We are a **schedule-ahead service**, we **do not call ahead**, and we can only wait for riders for 5 minutes at their pick-up time and location.
2. We only give rides to groups of **3 or fewer** to prioritize groups that are at higher risk.
3. We are a **free service** and do not accept tips.

Mental Health and Wellness

Life at college can be very complicated. Students often feel overwhelmed or stressed, experience anxiety or depression, struggle with relationships, or just need help navigating challenges in their life. If you're facing such challenges, you don't need to handle them on your own--there's help and support on campus.

As your instructor if I believe you may need additional support, I will express my concerns, the reasons for them, and refer you to resources that might be helpful. It is not my intention to know the details of what might be bothering you, but simply to let you know I care and that help is available. Getting help is a courageous thing to do—for yourself and those you care about.

University Health Services help students cope with difficult emotions and life stressors. If you need general resources on coping with stress or want to talk with another student who has been in the same place as you, visit the Duck Nest (located in the EMU on the ground floor) and get help from one of the specially trained Peer Wellness Advocates. Find out more at health.uoregon.edu/ducknest.

University Counseling Services (UCS) has a team of dedicated staff members to support you with your concerns, many of whom can provide identity-based support. All clinical services are free and confidential. Find out more at counseling.uoregon.edu or by calling 541-346-3227 (anytime UCS is closed, the After-Hours Support and Crisis Line is available by calling this same number).