

BIOL 4684.201: Ecology

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Media: [The Watson Research Lab](#),
[Facebook Classes](#), [Facebook Research](#)
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Time and Place of Class Meetings:

BIOL 4684.201 will be held in Room 207 of Bolin Hall at 12:30-1:50 on Tuesday and Thursday.

Students whose last names begin with A-J may report on Tuesdays and those whose last names begin with K-Z may report on Thursdays. Attendance is optional but suggested. All lecture content will be posted on D2L as video lectures and on campus outdoor laboratories will be performed during lecture times.

Course Description:

This course covers distribution of organisms in the world: biomes; the physical environment; energy flow in ecosystems; population structure and dynamics; growth, distribution, dispersal patterns; species interactions; community structure: species abundance and diversity, theories of diversity; community changes: succession. Concurrent laboratory participation with periodic outdoor laboratories required. Prerequisite(s): One year of Biology, MATH 1233; BIOL 3534 recommended.

Note: Modern Biology (particularly Ecology) is an integrative discipline, incorporating elements of Mathematics, Chemistry, Computer Science, and Writing. We expect that you have at least a basic understanding of each of these elements.

Student Learning Outcomes:

Upon completion of this course, you should be able to:

- Describe the levels of biological organization.
- Understand and apply the scientific method.
- Evaluate experimental results objectively.
- Understand major ecological hypotheses (ex: the niche and competitive exclusion)
- Understand the interaction of organisms with their environment (definition of Ecology!).
- Understand basic principles of evolutionary ecology, population ecology, community ecology, and behavioral ecology.
- Understand ecological processes such as resource partitioning, invasiveness, and extinction.
- Describe and recognize adaptations of organisms to their environment.
- Understand energy flow and nutrient cycling
- Understand and apply common sampling techniques for biodiversity
- Understand basic data analysis and presentation
- Critically evaluate the scientific literature in Ecology
- Have a meaningful conversation about Ecology

Expectations:

Follow along with course materials, take quizzes and exams before the time they are due, and ask questions when you do not understand.

Required Textbooks and Other Course Materials:

Begon, Howeth, and Townsend. Essentials of Ecology. 4th edition.
ISBN: 978-0470909133

McMillan, V.E. Writing Papers in Biological Sciences. Any edition 5-7. (suggested, not required)

Desire2Learn (D2L):

D2L is an integral part of this course. Weekly video announcements, video lectures, and exams will be posted and/or linked to from D2L. Class notes and links to supplemental information will also be available here.

Check D2L regularly!

Virtual Office Hours:

I will be available via Zoom for five scheduled office hours per week. You may also e-mail me and schedule a meeting at our mutual convenience. My Zoom personal meeting ID is: [728 649 5580](https://us02zoom.us/j/7286495580). I will admit you from the virtual waiting room as soon as I am available.

Grading Policy:

Lecture Grade

Biology 4684 consists of both a lecture and laboratory component that function together. Points earned in lecture are equal to those earned in laboratory. I use the following standard scale when assigning your composite grade: 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, 0-59%=F.

Final Course Grade = (All earned points + insight rewards)/(550).

Your grade will be determined by THREE lecture exams (100 points each), one oral presentations over a historical figure in Ecology (25 points), a written report with oral presentation (100 points), three laboratory exercises (25 points each), and iNaturalist participation (50 points). I expect you to contribute to our discussion regularly. I will reward particularly insightful points derived from outside reading. Written exams cover both specific and conceptual questions. You need a blue book from the bookstore for each exam.

Laboratory Grade

There is no separate laboratory grade.

Attendance Policy:

Attendance is not required. If you do not feel comfortable in the classroom setting due to COVID-19 or any other reason, do not come to class. Also, if you feel the least bit ill...please stay home. There is no penalty for missing class due to illness. All the information will be available online. Exams will be given during class time to half the class on Tuesday and half the class on Thursday. We will generally cover one chapter in the book a week.

Diversity, Equity, and Inclusion:

This classroom (virtually or in person) is a safe place. We are all part of a learning community comprised of diverse backgrounds, skills, ideas, and orientations. People of all diversity dimensions are welcome and valued and I am committed to an inclusive learning environment free from harassment, sexual misconduct, discrimination, or violence. Hate speech will not be tolerated and any form of harassment will result in expulsion from the classroom and a report to the proper university authority.

Conduct Policy:

Be respectful to everyone in the class, including yourself. **Cheating in any form will not be tolerated and may result in you receiving an “F” in the COURSE.** Please refer to the [Student Honor Creed](#).

Classroom Technology:

Smartphones, Laptops, and tablets are allowed as long as they are silenced and you use them for the purpose of taking notes or supplementing the lecture. If you are reported as misusing this privilege, individuals will no longer be allowed to have their technology in use during class time. I have no problem with being voice recorded. Do not answer cell phone calls in class! No classroom technology is allowed during exams or quizzes. MSU has negotiated special purchase deals with Dell should a student wish to purchase a new laptop. These purchase options can be found [here](#). Models with greater capability are listed under “Science and Engineering”.

Students with Disabilities:

Any student with a disability is encouraged to contact [Disability Support Services](#) (DSS) at 940-397-4140. Special accommodations will be made once the student has been evaluated and provides documentation from that office. However, I will work with you to ensure success regardless of your status with DSS.

Campus Carry:

Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University’s webpage regarding [Campus Carry](#).

COVID-19:

Please review the [MSU Texas Return to Campus Plan](#)

For this semester, students attending class must comply with MSU’s requirement for wearing a face covering as mandated in the [MSU Texas Facial Covering Requirement](#) document.

Cleaning supplies are available upon entry to the classroom. Please sit only in designated seats and maintain as much distance as possible between yourself and other students.

The MSU Safety App provides a link a COVID-19 screening assessment. The MSU Safety App is available on the [Apple Store](#) or [Google Play App Store](#).

IF YOU FEEL ILL IN ANY WAY DO NOT COME TO CLASS!!!

Lecture Schedule

Fundamentals of Ecology

Major Themes: History of Ecological Study, Scale, Biodiversity, Rigor, Application, Evolution, Speciation, Vicariance, Climate, Resource Partitioning, Competition, The Niche, Ecological Patterns, Biomes

Highlighted Figures: Aristotle, Theophrastus, Carl Linnaeus, Alexander von Humboldt, Charles Darwin, A.R. Wallace, Ernst Haeckel, Arthur Tansley, Vladimir Vernadsky, Charles Elton, Joseph Grinnell

Corresponding Textbook Chapters: 1-4

EXAM I

Ecological Patterns and Processes

Major Themes: Life History, Demographics, Dispersal and Migration, Intra- and Inter- Specific Competition, Population Ecology, Community Ecology, Behavioral Ecology, Predator/Prey Relationships, Evolutionary Ecology, Metapopulations, Food Webs, Richness, Energy Flow, Nutrient Cycling

Highlighted Figures: Henry Chandler Cowles, Karl Möbius, Eugene Odum, Howard Odum, G. Evelyn Hutchinson, Robert MacArthur, Eric Pianka, David Tillman, Robert Paine, Roger Arliner Young

Corresponding Textbook Chapters: 5-11

EXAM II

Synthesis and Application

Major Themes: Anthropogenic Effects, Sustainability, Management, Habitat Degradation, Reclamation, Remediation, Conservation, Biodiversity Hotspots, Funding, Future of Ecology.

Highlighted Figures: E.O. Wilson, Dian Fossey, Jane Goodall, Rachel Carson, Marjory Stoneman Douglas, Wangari Maathai, Majora Carter

Corresponding Textbook Chapters: 12-14

Exam 3: FINAL EXAM Day

Laboratory Schedule

(Tentative...This one will inevitably change because of weather)

12, 13 January:	Introduction/Syllabus/Scientific Method
19, 21 January:	iNaturalist / Dichotomous Keys / Using Field Guides / Campus Walk
26, 28 January:	Richness / Evenness / Diversity Indices
02, 04 February:	Biomass Lab
09, 11 February:	No Lab
16, 18 February:	Sampling and Characterizing Aquatic Habitats
23, 25 February:	Field Lab, Exercise I Due "Cemetery" Lab
02, 04 March:	"Cemetery" Lab
09, 11 March:	Sampling Vegetation and Plant Diversity
23, 25 March:	Field Lab – TBA, Exercise II Due
30 March, 01 April:	No Lab
06, 08 April:	GIS/Niche Modelling
13, 15 April:	Field Lab
20, 22 April:	Presentations of Projects, Exercise III Due
Finals Week:	Written Report Due