

## Course Information

Course Number:	ECCB/EEBL 6600
Course Title:	Populations, Communities, and Ecosystems
Time:	1:30 – 2:45 p.m. (Tue, Thur)
Location:	TBD
Credit Hours:	3

## Instructor Details

Instructors:	Dr. Kirk Winemiller	Dr. Thomas Boutton
Office:	WFES 216	WFES 206
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Office Hours:	Available by appointment	Available by appointment

## Course Description

This course reviews the basic principles and methodologies of ecology and prepares graduate students to pursue advanced study in subfields such as population biology, community ecology, evolutionary ecology and ecosystem science. Emphasis is placed on population, community and ecosystem processes that also have significance and influence at landscape, regional and global scales as well as proximate to evolutionary time scales. Basic principles of ecology that are critical to biological conservation and sustainable use of ecosystems and renewable natural resources are reviewed.

## Course Prerequisites

Graduate student status.

## Course Learning Outcomes

Through lectures, readings and discussions, students will obtain an overview and achieve in-depth knowledge of the field of ecology, including historical development of the discipline, current issues and methodologies, and practical applications in areas such as natural resource and land management, biological conservation, agroecosystems, and human/environmental health. Students will practice critical thinking, communication skills, and professionalism.

## Textbook and/or Resource Materials

Lectures, assigned required readings from the scientific literature, and other supplemental course materials will be available on Canvas. There is no required textbook.

## Grading Policy

- **Grading:**

	<u>Points:</u>	<u>% of Grade:</u>
Summary critique 1	50	20
Summary critique 2	50	20
Final exam	100	40
Class participation	50	20
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Total Points	250	100

- **Criteria for Final Course Grades:**

<u>Points Accrued:</u>	<u>% of Points:</u>	<u>Letter Grade:</u>
225-250	90-100	A
200-224	80-89	B
175-199	70-79	C
150-174	60-69	D
<150	<60	F

- **Summary/Critique Papers:** 40% of the course grade will result from two papers that summarize and critique recently published journal articles dealing with ecology. Each of these papers will be between 1.5 and 2 single-spaced typed pages. These papers will explore cutting-edge topics, and students' writing will display knowledge, critical thinking and effective communication. The instructor will provide a list of candidate topics for each summary/critique paper. Students should go to the following journals to find a paper to summarize and critique: *Ecology*, *Ecological Monographs*, *Ecological Applications*, *Ecology Letters*, *Journal of Animal Ecology*, *Journal of Ecology*, *The American Naturalist*, *Conservation Biology*, *Oikos*, *Oecologia*, *Science*, *Nature*, *PNAS* (check with instructor if you find a good article in another ecological journal). Articles must be published no earlier than 2016.
- **Final Exam:** 40% of the course grade will result from a final exam. The exam format will be similar to a written doctoral prelim exam, consisting of four essay questions.
- **Class Participation:** 20% of the course grade will result from class participation. Students are expected to come to class having read assigned readings and prepared to discuss content and related concepts in a more than superficial manner.

<u>Points:</u>	<u>Criteria:</u>
50	Demonstrated excellent preparation. Offered analysis and synthesis. Put together pieces of the discussion to develop new approaches.
40	Demonstrated good preparation. Offered interpretation and analysis. Demonstrated consistent ongoing involvement.
30	Demonstrated adequate preparation. Offered straightforward information without elaboration. Demonstrated sporadic involvement in discussion.

20	Tried to respond when called upon, but did not offer much. Demonstrated infrequent involvement in discussion.
10	Rarely contributed to classroom discussions in a meaningful way.
0	Never contributed to discussions.

- **Late Work Policy:** Work submitted by a student as makeup work for an excused absence is not considered late work. The submission of late work (i.e., submitting a deliverable after the established deadline) must be justifiable and pre-approved by the instructors.

## Course Schedule and Topics – Fall 2021

Tue Aug 31	<i>Introduction</i> and course expectations
Thu Sep 2	<i>Realm of ecology:</i> Historical development of perspectives and key contributors
Tue Sep 7	<i>Realm of ecology:</i> Historical development of perspectives and key contributors
Thu Sep 9	<i>Biogeography and Macroecology:</i> Speciation, isolation, adaptation, extinction, environmental gradients
Tue Sep 14	<i>Biogeography and Macroecology:</i> Species distribution models, island biogeography, metacommunity concept, habitat fragmentation
Thu Sep 16	<i>Biogeography and Macroecology:</i> Reserve connectivity, species invasion and biotic homogenization
Tue Sep 21	<i>Population Dynamics:</i> Intrinsic rate of increase, exponential growth, logistic growth, density dependence, net reproductive rate
Thu Sep 23	<i>Population Dynamics:</i> Life tables, survivorship, fecundity, population structure, aggregate models, age/stage structured models
Tue Sep 28	<i>Population Dynamics:</i> Metapopulation models, individual-based models, life history strategies and population regulation
Thu Sep 30	<i>Species Interactions:</i> Competition, adaptive divergence, niche overlap, diffuse competition, niche complementarity
Tue Oct 5	<i>Species Interactions:</i> Predation/parasitism, plant defenses, mutualism, commensalism, coevolution, coevolutionary mosaic
Thu Oct 7	<i>Species Interactions:</i> Invasive species, epidemiology, biocontrol
Tue Oct 12	<i>Communities, Metacommunities, and Assembly Rules:</i> Neutral model, patch dynamics, species sorting, mass effects, intermediate disturbance

Thu Oct 14	<i>Communities, Metacommunities, and Assembly Rules:</i> Community structure, between-region convergence, supply-side ecology, invasive species
Tue Oct 19	<i>Communities, Metacommunities, and Assembly Rules:</i> Extinction vortex, empty niches, regime shifts, biotic indices
Tue Oct 19	Literature Critique #1 submitted today
Thu Oct 21	<i>Ecological Energetics:</i> Physics and energy budgets, the climate system
Tue Oct 26	<i>Ecological Energetics:</i> Primary production and decomposition
Thu Oct 28	<i>Ecological Energetics:</i> Food chains, food webs, trophic ecology
Tue Nov 2	<i>Biogeochemistry:</i> Soil properties and processes, the water cycle
Thu Nov 4	<i>Biogeochemistry:</i> Carbon cycle
Tue Nov 9	<i>Biogeochemistry:</i> Nitrogen cycle, phosphorus cycle
Thu Nov 11	<i>Biogeochemistry:</i> Global changes due to human impacts on biogeochemistry
Tue Nov 16	<i>Pattern and Process in Ecosystems and Landscapes:</i> Role of disturbances in ecology
Thu Nov 18	<i>Pattern and Process in Ecosystems and Landscapes:</i> Succession
Tue Nov 23	<i>Pattern and Process in Ecosystems and Landscapes:</i> Spatial and temporal scaling, linkages and interactions between ecosystems
Thu Nov 25	Thanksgiving – No class
Tue Nov 30	<i>Pattern and Process in Ecosystems and Landscapes:</i> Landscape ecology, ecological restoration
Thu Dec 2	<i>Biomes:</i> Biogeographic distributions, environmental controls, forests, savannas
Tue Dec 7	<i>Biomes:</i> Grasslands, deserts, arctic and alpine tundra,
Thu Dec 9	<i>Biomes:</i> Wetlands, marine ecosystems, urban ecosystems
Thu Dec 9	Literature Critique #2 submitted today
Dec	Final Exam

## University Policies

This section outlines the university level policies established by the TAMU Faculty Senate:

### *Attendance Policy*

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments. Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

### *Makeup Work Policy*

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor. Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

### *Academic Integrity Statement and Policy*

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at [aggiehonor.tamu.edu](http://aggiehonor.tamu.edu).

### *Americans with Disabilities Act (ADA) Policy*

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a

disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit [disability.tamu.edu](http://disability.tamu.edu). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

### *Title IX and Statement on Limits to Confidentiality*

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

### *Statement on Mental Health and Wellness*

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org).

## Department Policies

### *Non-Discrimination Policy*

A major goal of the Department of Ecology and Conservation Biology is to foster a learning environment that nurtures diversity and promotes inclusion. Texas A&M University and the Department of Ecology and Conservation Biology are committed to the fundamental principles of academic freedom, equality of opportunity, and human dignity. We expect a climate that values and nurtures collegiality, diversity, pluralism, and the uniqueness of the individual within our state, nation, and world. Texas A&M University, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, gender identity, disability, age, sex, sexual orientation, marital or parental status, national or ethnic origin, or veteran status in employment, educational programs, and admissions. Discrimination of a student in class, i.e., behavior directed against a particular student that harms, humiliates, or intimidates that student, will not be tolerated. The mere expression of one's ideas is not discrimination and is fully protected by academic freedom; however, personal attacks of individual students are not permitted.

We do not tolerate:

- Racial and ethnic harassment (defined in Student Rule 31; <https://student-rules.tamu.edu/rule31>)
- Sexual harassment (defined in Student Rule 47; <https://student-rules.tamu.edu/rule47>)

We will report any incidents to the proper TAMU authorities:

- TAMU Stop Hate: <https://stophate.tamu.edu/>
- TAMU Tell Somebody: <https://tellsomebody.tamu.edu>

## Helpful Student Resources

Texas A&M University has a remarkable assemblage of student support resources that can help you with nearly all aspects of your academic and personal life. Everyone should be aware of these resources in case you might be able to benefit from them now or in the future. This web site identifies these resources and provides contact information: <https://eccb.tamu.edu/student-resources/>

## COVID-19 Policies and Information

### *Campus Safety Measures*

To promote public safety and protect students, faculty, and staff during the coronavirus pandemic, Texas A&M University has adopted policies and practices to limit virus transmission. Students must observe the following practices while participating in face-to-face courses and course-related activities (office hours, help sessions, transitioning to and between classes, study spaces, academic services, etc.):

- Self-monitoring—Students should follow CDC recommendations for self-monitoring. **Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely if that option is available, and should not participate in face-to-face instruction.**

- Face Coverings—[Face coverings](#) (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain. Description of face coverings and additional guidance are provided in the [Face Covering policy](#) and [Frequently Asked Questions \(FAQ\)](#) available on the [Provost website](#).
- Physical Distancing—Physical distancing must be maintained between students, instructors, and others in course and course-related activities.
- Classroom Ingress/Egress—Students must follow marked pathways for entering and exiting classrooms and other teaching spaces. Leave classrooms promptly after course activities have concluded. Do not congregate in hallways and maintain 6-foot physical distancing when waiting to enter classrooms and other instructional spaces.
- To attend a face-to-face class, students must properly wear an approved face covering. If a student refuses to wear a face covering, the instructor should ask the student to leave and join the class remotely. If the student does not leave the class, the faculty member should report that student to the [Student Conduct office](#) for sanctions. Additionally, the faculty member may choose to teach that day's class remotely for all students, or dismiss the class in the case of a traditional face to face lecture.

### *Personal Illness and Quarantine*

Students required to quarantine must participate in courses and course-related activities remotely, if that option is available, and **must not attend face-to-face course activities**. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities.

Students experiencing personal injury or illness that is too severe for the student to attend class qualify for an excused absence (See [Student Rule 7, Section 7.2.2.](#)) To receive an excused absence, students must comply with the documentation and notification guidelines outlined in Student Rule 7.