

General Ecology –BIO3409 –SPRING-2018

Instructor: Dr. Carmen G. Montaña-Schalk

Office: LDB #107

Email (preferred contact): cgm026@shsu.edu

Lectures: -M-W-F 9:00 am – 9:50 am

Office hours: M -W 1:00 – 3:00PM or by appointment

Location: Lecture LDB-220

Labs (depending on section)

Credit Hours: 4

COURSE DESCRIPTION: Ecology lecture will introduce the major ecological principles, concepts, classical and contemporary hypotheses dominating the field of ecology.

COURSE OBJECTIVES: As an introductory general ecology course, students should leave with a thorough understanding of:

- 1) The importance of science and ecology to contemporary society.
- 2) Scientific field and how ecologists conduct research.
- 3) The importance of general ecological knowledge.

Moreover, this class will help develop critical thinking, oral and written communication, and give the students the tools necessary to link ecological patterns/processes to current human activities.

Prerequisite: Minimum grade of C in Botany and Zoology - BIOL1311/1111 & 1313/1113 or equivalent.

COURSE TEXT: A book is not required for this class, but students are encouraged to consult any textbook that deals with Ecology. A good book to read is *Bowman et al. 2017. Ecology. Fourth Edition (any other edition can be used).* We will not follow the book slavishly, but you will need to keep up with required readings, and will find it a necessary and valuable reference work as well.

Lab: No Text Required –

COURSE STRUCTURE

I will deliver informal lectures on Mondays and Wednesdays. **On Fridays**, we will have professor-student discussions about an assigned paper. NOTE: 25 pts of your course grade will result from class participation via paper discussions, I strongly encourage to come to class and participate via discussion.

1. **Lecture** will cover the basics biological processes at the level of whole organisms and higher (populations, communities, and ecosystems)
2. **Labs** are part of the course and will be included in the final grade. Make sure you attend!
A note about the laboratory: I have no direct role in the material covered, the lab's organization, or the grades assigned to students for the laboratory portion of the course. Any questions or concerns regarding the laboratory should be directed to the lab TA.
3. **Attendance** is mandatory in lecture, **and you will benefit greatly by attending.** I will cover information that is not in your book that you will be responsible for knowing on the exams. See below for missed assignments policy. An abbreviated version of the lectures will be posted on Blackboard.
4. **Reading** the assigned papers and all handouts provided in class is necessary for the class and will be covered on the exams.
On Fridays, there will be formal class discussions from assigned papers related to the class material. In some instances, instructors-led discussions, but most sessions will consist of student-led and instructor-facilitated group discussions.
Each student in the class will have the opportunity to lead a paper discussion and professor will facilitate group discussion. All students are encouraged to come to class having read the paper assigned for that day. The material presented by each student is necessary and will be covered by lecture quizzes and exams.
5. **TAKE NOTES!** It is your responsibility to come to class and take notes.

EVALUATION METHODS: Your final grade will be average from both the lecture and lab assignments

THERE WILL BE NOT MAKE UPS OR LATE ACCENTANCES

1. **Lecture Tests (400 pts):** *There will be four lecture tests (100 pts each) given throughout every unit. All four tests will be held in class.* The test questions will vary in format, but will likely range from short answer, graphical interpretation, and multiple choices. Rather than testing your ability to memorize definitions, the tests are designed to evaluate your conceptual understanding of the topic and your ability to apply that knowledge to a practical situation. The best way to do well on these exams is to begin studying early and asking questions about subjects that were not clear in class. Usually, my evaluation (i.e., grading) of any given test answer comes down to my determination of how well you understand the topic. Based on my evaluation, I assign a percentage to score your demonstrated level of understanding for each question.

Your total grade for the exam is simply the sum of the weighted percentages of all answers on the exam.

Therefore, the grade you get on an exam is completely under your control. The grade you receive is based on how well you prove to me in your answer that you understand the concept being addressed in that question. If you expect to receive an **A** on an exam, you must prove to me that you have at least a 90% understanding of all the subject material covered by those test questions. Students that are successful on my in-class tests think deeply about the questions and they provide detailed, well written responses to each question.

Important: Your TAs and Dr. Montaña will attempt to grade every lab report, assignment, and exam fairly and accurately. Dr. Montaña will not provide exam reviews or review sessions. Dr. Montaña holds onto all exams; tests can be viewed during office hours. If you disagree with how an assignment or exam was graded, you must submit in writing a request for a regrade within a week of the assignment or exam being review. The request must include a detailed written statement about why you think your answer is correct. If you submit any exam question for regrade, then I will reserve the right to regrade the entire exam.

On the exam days, please arrive 10 minutes early, put away books and notes before the exams are distributed, and do not wear hats

2. **Topic Assignments (200 pts):** There will be various assignments (e.g., **quizzes via TopHat, paper critiques, paper discussions, and digital specimen collection**) over various topics covered during lecture. These assignments will be designed to test further your concrete comprehension of specific subject matter, i.e., definitions, etc. The best way to get credit for these assignments is to complete the task early putting forth 100% effort. Assignments that are done last minute or with little thought do little for the learning process and ultimately affect the grade you receive. My questions usually involve deeper level thinking that takes time to develop. This is why the unit tests are designed as take-home exercises – because you need time to develop a good answer.

Paper discussions (30 pts) Dr. Montaña will provide papers in advance for Fridays class discussions. Most papers for the discussion are classic papers related to the topic discussed each week. 25 pts of course grade will result from discussion participation. Students are expected to come to class having read assigned readings and prepare to discuss content and related concepts in a more superficial manner.

Paper critiques (30 pts) There will be two critiques (15 pts each paper) that summarize and critique published journal articles dealing with ecological issues (at any ecological level: organismal, population, community, and ecosystem ecology). Each of these papers will be between **1.5 and 2 single-spaced typed pages (Times New Roman, font size 12pt)**. The aim of these critiques is to develop your ability to effectively read and understand the scientific literature. The students will **briefly (1/4 of a page) summarize the article**, and provide a critical review of the paper which includes important contributions provided by the study, as well as flaws or shortcomings. Students will **pose two questions** that came to mind while reading the paper and a **justification** for asking those questions based on their scientific knowledge. Student may go to any of the following journals to select a paper to summarize and critique: *Ecology, Ecological Monographs, Ecological Applications, Ecology Letters, Journal of Animal Ecology, Ecology and Evolution, Oikos, Science, Oecologia, Science, PNAS*. **Articles must be published not earlier than 2012.**

Class Quizzes/Participation via TopHat (40 pts) An undetermined number of questions/in-class activities will be carried out during lecture using TopHat (see information below). Activities will be unannounced. If at least 90% of all activities are answered correctly, students will receive full credit, with a sliding scale after that.

%	Points Earned
90%-100%	40
80-89.9%	30
70-79.9%	20
60-69.9%	10
59.9 & below	0

I reserve the right to assign in lecture pop-quizzes that count as points towards the final score at any time (See class policies)

Digital Specimen Collection (100 pts) Students will be required to upload a *minimum* of 30 observations of fauna (animals) and flora (plants) taxa to [iNaturalist.org](https://www.inaturalist.org/) (<https://www.inaturalist.org/>). The **free iNaturalist app** is a tool that can enhance learning as well produce research data that can be used by students in self-and-teacher designed projects through formal and informal learning. With iNaturalist, students can upload photos of organisms, georeference, identify species of flora and fauna immediately, and access to a global community of experts. Students that participate in iNaturalist interact, get feedback and learn about everyday biodiversity.

The students will work on a general project that involves student-driven inventories of flora (plants) and fauna (animals) at Sam Houston State University properties including SHSU campus, the Center of Biological of Field Studies (CBFS) and the Homestead area. This is an activity that students will contribute not only to student's final course grade, but also to exploring all biodiversity on the property for the university and autogenerates species list. I will provide students with guidelines on using the free iNaturalist app, and we will develop a project with research questions that need to be assessed using the scientific method. Students will work in collaborative groups and have 10 weeks to complete their project. The final product of the research project will involve students working with the data collected using iNaturalist app. Students are required to present a report and a power point presentation of species of flora and fauna documented at SHSU properties.

Only one student can "observe" an individual specimen per field site (e.g., you cannot post pictures of five same Squirrels from CBFS or SHSU campus). Observations made by other individuals (i.e., you need to be the one making the observation) or taken from game cameras are **NOT** allowed. All **Observations must be submitted to iNaturalist.org by 20 April 2018. Students reports are due on May 4 at 9:00 am in class, and final power point presentation will be on Wednesday, May 9 at 9:30am.**

Observations of must be uploaded to the course project page (*SHSU Biol3409 General Ecology Spring 2018*) as well as any additional appropriate project pages. For example: All Texas observations - *All Texas Nature*; Texas Amphibians & Reptiles – *Herps of Texas*; *Fishes of Texas*, *Birds of Texas*, *Plants of Texas*, etc.

Laboratory (400 pts [25%]): The mandatory laboratory portion of this class will reinforce, using a hands-on approach, the 4 major areas of ecological study (i.e., organismal, population, community, and ecosystem).

For each area of ecology, we will conduct a complete scientific study following the specific steps of the scientific method. You will be required to actively participate in each step for your grade. Specifics for lab will be presented in the special lab syllabus.

Some lab activities will take place at the Center for Biological Field Studies in Harmon Creek. When in the field, each student should dress appropriately, i.e., no sandals or flip-flops. Rather, each student should purchase an inexpensive pair of rubber boots or hip waders. Boots, long pants and long-sleeve shirts are ideal for fieldwork. There are venomous snakes, ticks, and chiggers at the field station, so proper attire is necessary.

<p><u>THERE ARE NO MAKE-UP ASSIGNMENTS PROVIDED FOR ANY REASON.</u> The only exception is for exams if the absence is planned and approved by the instructor <i>at least 15 days prior to the date of absence</i>. In this case an alternative exam will be given before the absence.</p>
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Final grades for BIOL 3409 will be determined by the following formula:

$$75\% (\text{FINAL LECTURE GRADE}) + 25\% (\text{FINAL LAB GRADE})$$

LECTURE GRADES:

Class component	Total points	Tentative dates
Lecture grades		
In-class topic assignments - Paper critique (30pts) - Paper discussion (30pts) - Class quizzes/participation via TopHat (40pts) - Digital Specimen Collection (100 pts)	200	Quizzes are <u>Unannounced</u>
4 Unit tests (100pts each)	400	Following or during each unit
Lab grades		
Activities and reports	400	Throughout the semester
Grand total	1000	

Grading scale: Grades will be calculated to the nearest tenth of a point (00.0%).

79.5% earns a C, not a B. *To clarify, I will not round grades upward.* You can track your score throughout the semester by checking your scores on BlackBoard. There will be no curve and no extra credit.

PERCENT	LETTER GRADE
100.0-90.0	A
89.9-80.0	B
79.9-70.0	C
69.9-60.0	D
59.9 and below	F

Exams and assignments due dates

Exam 1: 9 February 2018

Exam 2: 9 March 2018

Exam 3: 6 April 2018

Exam 4: 4 May 2018

First critique: 23 February 2018 at 9:00 am, in-class (hard copy)

Second critique: 23 March 2018 at 9:00 am, in-class (hard copy)

***iNaturalist* student presentations:** Wednesday May 9 at 9:00 am, in-class

Monday-Friday, March 12-16 → Spring Break for Faculty and students (NO CLASSES)

TENTATIVE LECTURE TOPICS

	Topics	Readings/discussions
1	Introduction to the course. Hierarchical Structure of Ecology and Value of Ecology.	
2	Organismal Ecology: Adaptation and speciation. Sexual selection, social interactions.	Boag, P. & P. Grant. (1981). Rapid selection in Darwin's Finches. <i>Science</i> 214:82-85.
3	Acclimation and physiological ecology. Biological activity curve.	Palumbi, S. (1984). Tactics of acclimation: morphological changes of sponges in an unpredictable environment. <i>Science</i> 255: 1478-1480.
4	Adaptations that maximize biological activity. Life history adaptations.	Mesquita et al. (2015). Lizard life histories. <i>Austral Ecology</i> 41:1-5.
5	Population Ecology. Population dynamics. Population growth models. Age and life history tables.	Niering, W.A., Whittaker, R.H. & Lowe, C.H. (1963). Saguaro: a population in relation to environment. <i>Science</i> 142: 15-23
6	Metapopulations, ecological corridors Genetic of small populations, maximum sustainable yield in fisheries	Damschen, E.I., N.M. Haddad, J.L. Orrock, J.J. Tewksbury, and D.J. Levey. (2006). Corridors increase plant species richness at large scales. <i>Science</i> 313:1284-1286
7	Community Ecology. Community properties. Communities across spatial scales. Succession and Disturbance.	Tilman, D. & A. Downing (1996). Biodiversity and stability in grasslands. <i>Nature</i> 367:363-365. Forcier, L. 1976. Reproductive strategies and the occurrence of climax tree species. <i>Science</i> 189:808-809.
8	Gradients of community structure. Island Biogeography.	Ricklefs, R. (1987). Community diversity: relative role of local and regional processes. <i>Science</i> 235:167-171
9	Ecological interactions: Competition, The Niche, Predation, Symbiosis, keystone species.	Connell, J.H. (1961). The influence of interspecific competition and other factors on the distribution of the barnacle <i>Chthamalus stellatus</i> . <i>Ecology</i> 42:710-723.
10	The Food Web, Top-Down Bottom-Up Regulation.	Zaret, T. & R. Paine (1973). Species introduction in a tropical lake. <i>Science</i> 182: 449-455.
11	Ecosystem Ecology. Ecosystem Function, Ecosystem production and decomposition.	Carpenter, S. & J.F. Kitchell (1988). Consumers control lake productivity. <i>BioScience</i> 38:764-769.
12	Nutrients and Nutrient Cycles Ecological Stoichiometry	Tsoi et al. (2011). Spatial and temporal variation in the ecological stoichiometry of aquatic organisms in an urban catchment. <i>J. N. Am. Benthol. Soc.</i> 30(2):533–545
13	Climate change and community response.	Brander, K.M. (2007). Global fish production and climate change. <i>PNAS</i> 107: 19709–19714
14	Biodiversity and Conservation.	Marti, P. (1973). The discovery of America. <i>Science</i> 179:969.
15	TBA –	
16	TBA –	

CLASS POLICIES

1. BlackBoard and Email: I will communicate with the class using email via Blackboard (BB). Thus, I expect you to check your email regularly for information regarding the class. Missing an email announcement is not an excuse for missing an assignment. Moreover, I will post general information about assignments, tests, and labs on BB. It is your responsibility to obtain these documents.

2. Communicating with your professor: Email will be the primary means of communication for the course. Any correspondence to your professor should follow the following format: subject line: BIOL3409, to whom (Dr. or professor xx), statement, thank you, and student's name. The professor has the right of not answering emails to those students that fail to follow this format.

3. Completing assignments: It is your responsibility to complete assignments independently and in a timely manner. **I will not accept any late assignments (i.e., you will receive a grade of zero for any assignment not submitted on time).**

4. Top Hat: We will be using the Top Hat (www.tophat.com) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. You can visit the Top Hat Overview (<https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system. An email invitation will be sent to you by email, but if don't receive this email, you can register by simply visiting our course website: <https://app.tophat.com/e/243431>: our Course Join Code is **243431**. Top Hat will require a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing. Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.

5. Attendance: Attendance in this class and laboratory is mandatory, expected, and often is directly correlated with grade. Most examination questions come from lectures and experiences show that those students who attend class consistently obtain the highest grade. Attendance will be recorded at the beginning of each class period. If you want to understand and learn ecology, don't miss class or lab.

I will not allow students to enter the class after 5 minutes the class has begun unless I have been informed of that you will be late before hand

6. Absence and Make-up Policy: Any points for assignments, participation, or exams missed as a result of an absence cannot be made-up. The only exception is if the absence is planned and approved by the instructor at least 15 days prior to the date of absence. In this case an alternative assignment will be given and turned in before the absence.

7. Academic Dishonesty: I expect all students to maintain honesty and integrity in this class. Any student found guilty of dishonesty will be subject to disciplinary action. Academic dishonesty includes cheating on exams, copying others work, and pasting text directly from the internet (i.e., plagiarism), etc. For a complete listing of the university policy, see: <http://www.shsu.edu/administrative/faculty/sectionb.html#dishonesty>

Any form of academic dishonesty will result in a grade of **zero** for the entire semester.

8. Cell Phone Use: Cell phone use and text messaging during class hours is **prohibited**. Please turn off ringers during class. Failure to comply with the above will result in expulsion from the classroom. Phones or other similar devices should not be present during testing. Use of these devices during a test is considered de facto evidence of cheating.

9. Students with Disabilities: Any student with a disability that prevents participation in any class activity or assignment should immediately contact the instructor so that arrangements can be made to ensure that participation and achievement opportunities are not impaired.

10. Visitors in the Classroom: Visitors (i.e., not registered students) attending the class must be approved by the instructor, and must not cause any disruption to registered students.

11. Audit: You must have the instructor's permission to audit this course, and auditing students must apply through the Registrar's office.

CLASSROOM CONDUCT– All students in the class must treat others with civility and respect and conduct themselves during class sessions in a way that does not unreasonably interfere with the opportunity of other students to learn.

If you have difficulties or complaints related to this course, your first action usually should be to discuss them with me. If such a discussion would be uncomfortable for you or fails to resolve your difficulties, you should contact Dr. Tami Cook, Chair of the Department of Biological Sciences.