General Ecology – BIO313  
FALL-2019  
Instructor: Dr. Carmen G. Montaña-Schalk

Office: BIO #123  
Email (preferred contact): montanascg@sfasu.edu  
Lectures: TUESDAY-THURSDAY 8:00 am – 8:50am  
Lab: TUESDAY: 12:00 - 2:50PM  
Office hours: THURSDAY 1:00 – 3:00PM or by appointment  
Prerequisites: “C” or better in BIO 131, BIO 133, MTH 138

[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 DESCRIPTION
This course will introduce the basics biological processes at the level of organisms, populations, communities, and ecosystems. Lectures will consist of informal lectures by the instructor, but also student’s participation via in-class paper discussion and PP presentations. The discussion sections will consist of student-led and instructor-facilitated group discussions. Through lectures, readings and discussions, students will obtain an overview and achieve in depth knowledge of the field of ecology.

The laboratory portion of this course will provide applications to the major ecological principles covered in lecture. Upon completion, students will have a basic level of experience for experimental techniques in ecology labs. Additionally, students will enhance their technical writing (or science writing) skills and become familiar with basic data analysis in Microsoft applications. The mandatory laboratory portion of this class will reinforce, using a hands-on approach of the four major areas of ecological study (i.e., organism, population, community, and ecosystem).

COURSE GOALS
- Understand the major ecological principles, concepts, classical and contemporary hypotheses dominating the field of ecology.
- Know the basic biological processes at the level of whole organisms and higher (populations, communities, and ecosystems).
- Recognize the factors that govern interactions between organisms and their environments.
- Know the importance of science and ecology to contemporary society, and the importance of Scientific field and how ecologists conduct research.
- Develop critical thinking, oral, and written communication, and use quantitative reasoning.

COURSE STRUCTURE
The professor will deliver informal lectures on Tuesdays and Thursdays. Every Thursday, we will dedicate 20 minutes of our lecture time to have student presentations and paper discussions about an assigned paper. All papers for the class discussion will be posted on D2L.

NOTE: Part of your course grade will result from class participation via paper discussions, I strongly encourage the students to come to class and participate via discussion.

1. Lecture (75%) will cover the basics biological processes at the level of whole organisms and higher (populations, communities, and ecosystems). Lecture attendance is mandatory, and prompt arrival is crucial.  
Lecture participation: Students will participate in prepared group activities, paper discussion and presentations, etc. Questions/activities for participation points could be given at any time of any class, including right at the beginning of lectures, so it is crucial to arrive on time.
Students discussion-participation will be recorded on a scale of 0 through 10 using the following guideline:

0-2 rarely, if ever, contributes;
3-4 occasional participation, but generally non-substantive, adding little new information;
5-6 occasional participation, but generally well thought out, useful contributions;
7-8 regular participation, sometimes useful, sometimes not;
9-10 regular participation, always useful.

Reading the assigned papers and all handouts provided in class is necessary for the class and will be covered on the exams. Each student 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 in lecture quizzes.

2. Laboratory (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 labs will be presented in the special lab syllabus.

[Some lab activities will take place outdoor in terrestrial and water ecosystems. When outdoor, 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, waters or hip waders. Boots, light long pants and long-sleeve shirts are ideal for fieldwork. When being outdoor, we are exposed to wild animals including snakes, ticks and chiggers, so proper attire is necessary]

ATTENDANCE is mandatory in lectures AND labs, and you will benefit greatly by attending. I will discuss information that is not in your PowerPoint slides and you will be responsible for knowing on the exams. See below for missed assignments policy. An abbreviate version of the lectures will be posted on D2L.

TAKE NOTES! It is your responsibility to come to class and take notes.

STUDENT RESOURCES: All students can have the ability do well in this course. A number of resources will help you do so.
1) All lectures will be posted on D2L.
2) Your book! It provides a chapter summary and review questions.
3) Exam reviews/practice problems will be provided before each exam.

Additional tips for success in this course...
1) Do your reading and in-class quizzes. They are basically free points if you spend the time doing them.
2) Study smart!! Memorization will not get you very far in this course. Exams will be derived from the main concepts in the textbook and learning objectives in class. The activities we do in class are designed to address the learning objectives. If we do something in class, you may be expected to do again on an exam. This means that for the exams, you need to practice your critical thinking, not just memorize the info!
EVALUATION METHODS: Your final grade will be average from both the lecture and lab assignments.

**THERE WILL BE NOT MAKE UPS OR LATE ACCEPTANCES**

1. **Lecture Tests (300 pts):** *There will be three lecture tests (100 pts each) given throughout the semester.* All three tests will be held in class. The test questions will vary in format, but will likely range from short answers, short/long essay questions, true/false, 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 exam will consist of 70% scantron questions (true/false, graphical interpretation, and multiple choices) and 30% short answers, short/long essay questions.

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 points 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 improve 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:** 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 or by appointments. 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 reviewed. 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, problems, homework, discussions, presentations, etc.) 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 some assignments are designed as take-home exercises – because you need time to develop a good answer.

2.1. **Quizzes (50 pts):** There will be short in-class quizzes. Pop quizzes will cover 1) the material discussed that week, material from assigned papers, or material from the unit assignments. Pop quizzes cannot be made up no matter what the reason for the absence.

2.2. **Paper discussion (20 pts)** During the semester, each student will have 10 minutes to lead a short discussion (Q&A) on a paper assigned by Dr. Montana. The entire class will read each paper as preparation for a short discussion (10 minutes) and be expected to participate fully in the discussions. Dr. Montaña will assign the papers to the students in advance so that they can prepare for the discussions. Most papers for the discussion are classic papers related to the topic discussed each week. Students are expected to come to class having read the assigned readings and prepare to discuss content and related concepts in a more superficial manner.
2.3. Lecture term paper (100 pts): Students will research, write and prepare a short-term paper (~ 2000 words, < 5 pages) on an ecological topic that is of interest to the student. The student can choose and write about any subject that focus on any of the levels of organization in Ecology discussed during the semester. However, students MUST discuss the intended topic of their term paper with Dr. Montana and must gain instructor approval before moving forward with literature search, data collection/data analysis or writing of the term. Term paper topics must be designed around novel student-based observations, or analyses of data sets collected previously by the student (e.g., as part of an internship), or through the activities associated with this course (e.g., field trips, lectures, or laboratory sessions). Examples of suitable topics are provided by the professor. Each paper must cite a minimum of eight peer-reviewed and published sources (i.e., papers published in scientific journals or books), which must be cited (as appropriate) in the body of the text and listed at the end of the paper. Internet sources (e.g., Wikipedia) must not be cited. The paper must be written in the style Ecology journal format, and strictly adhere to author guidelines (https://esajournals.onlinelibrary.wiley.com/journal/19399170)

2.4. Paper presentation (30 pts): During the last week of class (Dec 9 - 13, 2019), each student will have 10 minutes to present their term paper using a PowerPoint presentation. I expect the student to dress well, semi-formal, as if you were to present at a professional meeting. Dr. Montana will provide more information during our class meetings.

There are no make-up assignments provided for any reason. The only exception is for exams 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 exam will be given before the absence.

Final grades for BIOL 313 will be determined by the following formula:

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

Lecture: The following weights will be sued to calculate an overall grade:

- Lecture exams (3 @ 100 pts each) 300 pts
- Lecture quizzes (unannounced during the semester) 50 pts
- In-class paper discussions 20 pts
- Term paper 100 pts
- Paper presentation 30 pts

Laboratory: Laboratory Activities (outdoor and lab) and Reports 200 pts (Throughout the semester)

$$700 \text{ pts*}$$

*NOTE: The total points value is somewhat tentative. Because labs rely on outdoor activity, some adjustments may have to be made if there is difficulty completing them due to weather, animal activity, etc. Adjustments are at the discretion of Dr. Montañà. However, adjustments should not be greater than 10% of total points stated above.

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 D2L. There will be no curve and no extra credit.

100.0% - 90.0% = A (Exceptional), 89.9% - 80.0% = B (above average), 79.9% - 70.0% = C (average), 69.9% - 60.0% = D (below average), < 59.9% = F (Fail)
Exams due dates

Exam 1: 1st October 2019 - in-class
Exam 2: 7th November 2019 in-class
Exam 3: 5th December 2019 - in-class

Assignments due dates
First draft of term paper, Tuesday, Sep. 17th, 2019 - in-class hard copy
Second draft of term paper, Thursday, Nov. 7th, 2019 - in-class hard copy
Final term paper, Friday, Dec. 6th, 2019 - submit via email, no later than 6:00PM
Paper presentation (Dec 9th to 13th - Final Week of Classes)

No classes
September 12th, 2019 → Dr. Montana at a NSF workshop. Student will work on their own term paper
November 25-29, 2019 → Thanksgiving for Students & Faculty

COURSE EVALUATIONS: It is now departmental policy to require students to fill out online class evaluations at the semester’s end. If you do not participate in the evaluation, one percentage point will be deducted from your lecture grade.

CLASS POLICIES

1. D2L and Email: I will communicate with the class using email via D2L. 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 D2L. It is your responsibility to obtain these documents.

2. Communicating with your professor: Email (montanascg@sfasu.edu) will be the primary means of communication for the course. Any correspondence to your professor should follow the following format: subject line: BIO313, to whom (Dr./Professor Montana), 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. 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.

5. Academic Integrity: I expect all students to maintain honesty and integrity in this class. Academic dishonesty includes cheating on exams, copying others work, and pasting text directly from the internet (i.e., plagiarism), etc. Cheating will absolutely not be tolerated. Be sure to review the university’s academic integrity policy which can be found at http://www.sfasu.edu/policies/4.1-student-academic-dishonesty.pdf

Cheating on an exam can result in a failing grade for that exam, a failing grade for the course, or even expulsion from the university.

Below is SFA’s statement regarding academic integrity. Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.
Definition of Academic Dishonesty. Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit.

6. Students with Disabilities. To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004/468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

7. 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.

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.

CLASS DISRUPTIONS: Class disruptions will not be tolerated because they detract from other students’ learning. As adults, students should be able to sit through class without disturbing others. It is recommended that students regard lecture as practice for future professional meetings; they may be fun, interesting, or horribly boring. Regardless, the student has to get through lectures acting like an adult. SFA defines acceptable behavior as follows:

**Acceptable Student Behavior**

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

Dr. Montaña does NOT necessarily give you a warning or make an announcement that you are disrupting class. Instead, points will simply be deducted in the grade book. Students are free to inquire at any time whether they have had points deducted during office hours.

**Tardiness:** Tardiness to lecture will not be tolerated; it disrupts the lesson and the concentration of fellow students. Reasonable accommodations will be made in cases of emergency situations if documentation is provided. It is the student’s responsibility to provide the instructor with documentation of emergencies. (10 points deducted each time)
Sleeping: Sleeping during class can be distracting to other students and the instructor. If a student is so tired that they cannot stay awake for a lecture, as boring as it may be, the student should not be in class. (10 points deducted each time)

Cell Phones: Cell phones must be turned off during lecture. If a cell phone goes off, the student may be asked to leave lecture for that day. In cases of family health (pregnant spouse, hospitalized family member, etc.), the student must inform the instructor of the situation BEFORE class begins. In these cases, the cell phone ringer must remain off (i.e., phone set to vibrate). (15 points deducted each time)

Leaving Class: Leaving class is disruptive to other students who are trying to pay attention. Leaving the class for any reason will count against you. This includes leaving during exams to use the restroom. Hence, be sure to use the restroom before coming to class. If a student knows they will need to leave class early, notify the instructor well ahead of time. Points will not be deducted if the student has a legitimate excuse for leaving early. (15 points deducted each time)

Talking/Disruptive Behaviors: Dr. Montana highly encourages students to ask questions or make relevant comments during a lecture. However, talking to a neighbor or other disruptive behavior will not be tolerated because, again, it disrupts the learning environment of other students. (15 points deducted each time)

Laptop computers: Laptop computers are not allowed in lecture. In my past experience, too many students have used them for surfing the internet or working on other projects during lecture, which distracts other students. (15 points deducted each time).

If you have difficulties or complaints related to this course, your first action usually should be to discuss them with Dr. Montaña.
## Tentative Lecture and Lab Topics**

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<th>Weeks</th>
<th>Lecture Topics</th>
<th>Lab topics</th>
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| W-1   | **Introduction to the course**  
Hierarchical Structure of Ecology and Value of Ecology  
Biomes                                                          | **Miller Science 134A**  
Orientation/Syllabus; lab safety, Expectations                      |
| W-2   | **Organismal Ecology:**  
*Organisms and their environment*  
Acclimation and physiological ecology:  
temperature, water, energy  
Biological activity curve, tolerance curve  
Adaptations that maximize biological activity                      | **Outdoor Lab:**  
Visit to Arboretum (Ruby Mize Garden)  
- Identify types of ecosystems: terrestrial/aquatic  
- Identify function and services of ecosystems                      |
| W-3***| *Evolutionary ecology: Natural selection, Adaptation and Speciation*  
Sexual selection  
**Readings will be assigned for this week**                      | Students will work on their own term paper  
Review/read literature basic statistical analysis to be used in  
this lab.                                                             |
| W-4   | *Evolutionary ecology: Natural selection, Adaptation and Speciation*  
Sexual selection  
Social/behavioral interactions  
Life history adaptations                                              | **Miller Science 134A**  
**Basic Statistics:** Sample description and testing  
Sample, range, Mean (Averages), media, mode, Standard deviations  
Parametric and non-parametric analyses  
T-test, Analysis of variance (ANOVA)  
Use of Excel for entering data and basic statistics  
- **In-class problems**                                              |
| W-5   | **Population Ecology**  
Population dynamics  
Population growth models  
Age and life history tables                                           | **Outdoor Lab (TBA):**  
Ecological Field Techniques: Aquatic and terrestrial  
- Quadrat sampling  
- Transect sampling  
- Capture techniques: nets, traps, etc.  
- Biotic sampling techniques: density, frequency, biomass, dominance |
| W-6   | Metapopulations and ecological corridors  
Genetic of small populations                                          | **Miller Science Building:**  
Organismal Ecology: Part 1 Animal adaptations  
Visit the vertebrate collections: Fish, Amphibian/Reptiles,  
Birds, Mammal?  
Observe/describe animal adaptations to different environments    |
| W-7   | **Community Ecology.**  
Community properties  
Communities across spatial/temporal scales  
Disturbance, Succession, Resilience theories                        | **Outdoor Lab:**  
Organismal Ecology: Part 2 Plant adaptations  
Plant adaptations (activities on campus). Plant adaptations by  
observing/describing plants in different environments  
(water plants, trees, grasses, moss, and shrubs)                  |
| W-8   | Gradients of community structure  
Island Biogeography                                                   | **Outdoor Lab:**  
Population Ecology: Part 1 Life tables  
- Data collection from Oak Grove Cemetery in Nacogdoches, TX.  
- Construction of life tables and survivorship curves               |
| W-9   | Ecological interactions:                                                     | **Outdoor Lab:**  
- Predator abundance, Prey abundance  
- Changes in predation rates, Predation trade-off |
|-------|---------------------------------------------|-------------------------------------------------------------------------------------|
| W-11  | **Ecosystem Ecology.**  
Ecosystem Function  
Ecosystem production | Outdoor Lab (La Nana Creek)  
Community Ecology: Part 1. **Species-Area curves, species diversity indices**  
- Identify areas/patches different sizes/substrate types  
- Count species in given area/patches  
- Calculate species-area relationships  
- Calculate Simpson's index among patches  
- Calculate Shannon-Wiener index among patches |
| W-12  | Nutrients and Nutrient Cycles  
Ecological Stoichiometry | Miller Science Building: Community Ecology: Part 2. **Functional groups and food webs**  
- Use published data of stomach content analysis and stable isotope analysis of fishes  
- Estimate prey abundance in fish species  
- Identify functional groups  
- Build biplots of Carbon and nitrogen ratios for fish species  
- Estimate trophic positions of fishes |
| W-13  | Climate change and community response | Miller Science Building:  
Ecosystem Ecology: Part 1  
- Energy Transfer in a Model Ecosystem |
| W-14  | **THANKSGIVING BREAK** | **THANKSGIVING BREAK** |
| W-15  | Biodiversity and Conservation-Students Presentations | Outdoor Lab: Ag Pond  
Ecosystem Ecology: Part 1  
Ecosystem Metabolism |
| 16    | Student Presentations/Grading | Lab Review/Grading |

**NOTES:**
*** Dr. Montaña will be in a NSF workshop this week (W-3). Students will work on mandatory assignments for lecture and lab.
** Outdoor activities may be subject to change with short notice due to weather conditions.