

BIOL 3680 Ecology Lab

I. General Information

Professor: Dr. Kenneth Schoenly
 Office: N271, 667-3949
 Off. Hrs: MW 8:00-9:30 (or by appointment)
 Email: kschoenly@csustan.edu

Semester: Fall 2019
 Credits: Lec/Lab 4
 Lab Mon: 2:00-4:50 (N210)
 Lab Wed 2:00-4:50 (N210)

II. Required Materials (acquire before 1st lab meeting)

- (1) *Ecology: Concepts and Applications, 8th ed.* by Molles (chapters shown in schedule below).
 Companion website: http://highered.mheducation.com/sites/1259880052/student_view0/index.html
- (2) The laboratory will rely mostly on handouts; these will be provided one week (or less) before the next lab meeting. Labs are experiment-based, quantitative reasoning exercises, requiring students to work in groups for data gathering, analyzing results, and report writing. Lab periods will also include brief student presentations.
- (3) *i>clicker (new/used/rental remotes available)*. Numerous pedagogical studies have shown that *i>clickers* improve student retention and learning. To receive both in-class participation and performance points, you are required to bring your remote every day (lecture & lab) and come to class on time. Register your remote online at <https://www.1clicker.com/register-clicker> and complete the fields: first name, last name, student ID, remote ID, etc. If you are late and miss the 1st question, you will forfeit points for that lecture. Questions will come from your readings and notes; performance points are earned if questions are correctly answered. If you are late and miss the 1st question, you will forfeit points for that lab. Using another student's *i>clicker* or using multiple remotes is a form of cheating and will be dealt with swiftly and severely according to the California Code of Regulations (see below).
- (4) Calculator. For in-class exercises and homework.

III. Course Description

Ecology is an experimental, observational, mathematical and correlative science. Interactions between organisms and their environment are at the heart of ecology and are crucial to understanding the evolution of life. Ecologists draw upon every field of biology to study organisms, including evolution, molecular biology, physiology, behavior and genetics. One semester is not enough time to explore all aspects of ecology, so **we will explore major concepts, hypotheses, theories and case studies to understand and investigate nature's processes.** To understand current trends and future directions, we will also summarize and critique published studies to see how their methods and findings contribute lasting impacts on the discipline.

An integral goal of this course is your continued development of critical thinking, written and verbal communication, quantitative reasoning, and experimental design skills. Laboratory exercises will guide you in the development of these skills. The peer-reviewed literature highlights the cumulative, decentralized, self-correcting, and hypothesis-driven features of how scientific knowledge is acquired. **I will assume you have read the associated material listed in the syllabus prior to coming to lab and may ask questions from this material.**

IV. Student Learning Goals (lab):

1. The student will become conversant in the terminology, concepts, methods, and major theories of ecology, integrated within the larger discipline of evolutionary biology, the central and unifying theme of biology.
2. The student will become familiar with different sampling methods, experimental designs & statistical tests & understand their assumptions, strengths, limitations and applications.

- The student will gain knowledge of ecological experiments, theories and models that unlock understanding and prediction of relationships and interactions between organisms and their environments.

V. Course Requirements

The course grade for the 4-credit course will be determined from the combined grades from lecture (**60%**) and the laboratory (**40%**). It is your responsibility to know where you stand in the class at any one time.

The rigors of this course **demand punctuality and regular attendance, and commitment and concentration** to the course readings, lectures, and lab activities. As per university regulations, students who do not attend the first class (without 24-hr prior or subsequent notice) will be dropped. Your required textbook presents a broad view of ecology, not just as a collection of facts, but as an ongoing research effort. In the lab, brief presentations, homework and lab reports will require students to demonstrate clear communication skills, neatness, critical thinking, problem-solving (verbal and mathematical), and biological knowledge about ecological concepts. **To succeed in this course, students must have a broad knowledge of organismal biology, taxonomy, habitats, and basic mathematics.**

Allow **at least 2 weeks** for homework and lab reports to be graded and returned. It is your responsibility to contact me in the event you miss an assignment (within 24 hr) documenting your absence (e.g., doctor's note, jury summons, funeral notice). Assigned homework and lab reports **have a no-exceptions due date and time. An unexcused absence for a gradable event will result in no score; however, in the event of a documented compelling circumstance, an attempt will be made to work out the conflict**

For your convenience, this syllabus and lab materials will be posted online using Blackboard. Find the Fall 2019 Blackboard courses to access materials.

Executive Order 1037 (effective August 2009) allows students to only repeat a course twice and in which they have earned less than a C grade. Students are only allowed to replace the first 16 units they repeat; those reaching the 16-unit limit may repeat an additional 12 units, but the resulting grade is averaged with all other grades. **Students repeating this class will do different lab reports than submitted and graded previously.**

VI. Personal Responsibility

Behavior that interferes with the instructor's ability to teach or the ability of students to benefit from instruction will not be tolerated. Examples include: audible ring tones, texting, repeated late arrivals or early departures, irrelevant conversation, and inappropriate use of phones or computers. Inappropriate behavior will be dealt with as severely as university regulations allow. Behavior that is not consistent with the Student Conduct Code – including any form of academic dishonesty (see below) – will result in disciplinary action. **At the start of lab, turn off cell phones. Check your university email daily for updates of information items.** Starting an email with “Hey” or no salutation is an inappropriate way to begin a professional conversation. Use email correspondence as an opportunity to practice your professional skills.

Cheating in any form is inappropriate conduct and will be dealt with swiftly and severely according to Sections 41301 through 41304 of Title 5 of the *California Code of Regulations* which includes expulsion, suspension and probation.

VII. Grading Procedure

Your active participation in each lab is expected, including outdoor activities. Work **COLLABORATIVELY** on group lab activities, but **INDEPENDENTLY** on individual assignments. On lab reports, you will use a scoring rubric to anonymously evaluate each other's contribution (i.e., anonymous peer review) that will factor into your final lab grade (a practice recommended by students in previous semesters). Except for two lab reports which are mandatory (see lab schedule below), you have the choice

of another group lab report to turn in to reach the required total. Lab reports are due 2 weeks after they are assigned.

Lab reports, completed worksheets, homework, i>clicker questions & conduct constitute the points earned in the lab. The laboratory will start promptly at 2 pm; traffic and/or car problems are not acceptable excuses for being late. **No extra credit will be offered beyond points listed below:**

Lecture portion:	600 (60%)
Lab Reports, homework, worksheets, i>clicker questions, conduct:	400 (40%)
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Total	1000 points

A = 900-1000, B = 800-899, C = 700-799, D = 600-699, F < 600 points. No +/- grading will be used.

VIII. Recording Policy:

Audio or video recording of classes (tape and digital format) is not permitted under any circumstances. If you do not intend to comply with this policy, please discuss this with the instructor or take another class. An exception is made for students registered with Disability Resource Services, who are approved for this accommodation. In such exceptions, DRS students will be asked to sign a “Recording Agreement” which disallows them from sharing recordings with other individuals unless approved by the DRS program.

Some Important Dates:

August 26, 28: First lab days	November 11: Veteran’s Day (no labs)
September 2: Labor day (no labs)	November 28, 29 (Thanksgiving, no classes)
September 19: Census date; last day to add/drop	December 2, 4 (last labs)
October 8: Non instructional day (no classes)	December 11: Reading Day

XI. Tips for Success:

This class has a reputation for being demanding and time consuming. If you are not prepared to dedicate the time and effort needed for this course, you should reconsider your enrollment. However, if you heed the following advice, the class can be made easier, and more enjoyable:

- Bring textbook to lab and be punctual and attend every lab meeting
- Review math and general biology notes to refresh memory; review upcoming material ahead of time
- Earn praise from lab partners by making substantive contributions to lab reports
- Take (write) complete notes & revisit/rewrite often (1:3 rule)
- Seek help from university tutors (Library, CVMSA “Commons”)
- Ensure neatness & legibility on lab reports, homework & worksheets; make sure you meet deadlines
- Review terminology and concepts using the book’s index, glossary, and end-of-chapter summaries
- If, after reviewing your graded papers & reports, you need clarification or have questions, come to my office hours (MW: 8:00-9:30).

Punctuality and regular attendance, correct spelling and grammar, and good penmanship are all necessary for succeeding in a professional career. Consequently, poor spelling, grammar or penmanship will result in lost points on homework, worksheets & lab reports; illegible answers will receive no credit (i.e., if I can’t read it, it’s wrong).

LAB SCHEDULE*

Lab Meeting	Topic(s)	Points
August 26, 28	Introduction, Lab Safety, Group Assignments, Homework & Lab Reports, Peer Review, EXCEL Hints & Tips, Sampling & Experimental Design 1 (lecture, map exercise [quadrat shape & size], worksheet) Read Ch 2 (climate diagrams) before next lab; you will use your textbook in lab	
September 9, 11	Sampling & Experimental Design 2 (lecture, map exercise [4 sampling designs], worksheet), Climate Diagrams (group exercise, graph & worksheet, presentations)	
September 16, 18	Sampling & Experimental Design 3 (lecture, group exercise, worksheet), Presentations (climate diagrams & experimental design)	
September 23, 25	Format for Lab Reports, Peer Grading, Parametric Statistics (t-test homework), *Duckweed Population Growth (setup, Day 0) Presentations (climate diagrams & experimental design)	50P 150P
Sept 30, Oct 2	*Duckweed Population Growth (Day 7), Geometric & Exponential Growth (lecture, part 1), Confidence Intervals	
October 7, 9	Duckweed Population Growth (Day 14, cleanup), Logistic Growth (lecture, part 2), Scientific Graphs & Tables	
October 14, 16	*Foraging & Flocking Behavior (outdoor lab, worksheet)	100**
October 21, 23	*Mark-Release-Recapture (isopod set up), MMR Methods (lecture)	100**
October 28, 30	*Mark-Release-Recapture (1 st of 3 estimates), Life Tables & Cemetery Demography (worksheet)	100**
November 4, 6	Mark-Release-Recapture Methods (2 nd of 3 estimates), Measuring H ₂ O Quality (3-4 day trial, make observations, worksheet)	
November 18, 20	Mark-Release-Recapture Methods (3 rd of 3 estimates, analysis & cleanup), Measuring H ₂ O Quality (analysis), pass out Whirl-Pak Bags (soil sample) Bring soil sample to next lab!	
November 25, 27	Soil Analysis 1 (setup, microclimates & ecology, worksheet)	
December 2, 4	Soil Analysis 2 (soil chemistry & ecology, worksheet)	

*Lab grade is based on a total of 400 points (3 lab reports, completed worksheets, homework, i>clicker questions, conduct)

¶Mandatory lab report (everyone is required to complete and turn in).

**Lab report with accompanying points (each group chooses 1 of the 3 options).

XII. Implied Contract:

This syllabus serves as a contract between you and the instructors. Your continued enrollment in this class denotes your understanding of, and agreement with, the material in the syllabus. You are expected to retain this syllabus and keep it in your notebook or textbook to refer to during the semester.

Useful & Informative Web Links:

Pseudorandom number generator: <https://www.random.org/>

Randomized Control Trial (YouTube video, 1:23 min): https://www.youtube.com/watch?v=Cn2iuaQa_44