

2020 Syllabus for Biology 312: General Ecology

Lecture: Monday/Wednesday/Friday 10:00am–10:50am

Lab: Thursday 8-10:50am

Instructor: Dr. Althea A. Archer

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Virtual Office Hours: Mon/Fri 12:15-1:15pm & Th 11:30-12:30

Link: <https://minnstate.zoom.us/j/99287589339>

Meeting ID: 992 8758 9339

Passcode: Archer

The schedules and policies associated with this course may be subject to revision or change as a consequence of changing circumstances or events. Reasonable notification will be provided to students prior to any major changes in course policies or procedures.

Course Description

Interactions between organisms and their organic and inorganic environment. Biomes, climate, populations, communities, biotic interactions, energy and nutrients, landscape and spatial ecology, biodiversity patterns.

Learning Outcomes

You will learn to draw together elements from biology, chemistry, physics, geology, and mathematics to gain a greater understanding of ecological relationships in the natural world. The goals of the course are to:

1. Classify organizational levels observed in ecology
2. Explain how populations are regulated and how data can be collected, analyzed, and interpreted using statistics, life tables, graphs, and survivorship curves
3. Describe the interactions between different species and how they impact one another
4. Illustrate the major forces responsible for community structure, how community structure can be represented by food webs, and how communities change in both space and time
5. Discuss patterns and measurements of biodiversity and predict the consequences of continued species loss
6. Accurately and effectively document field observations with field notes and data collection
7. Link field observations with key ecological concepts and relevant scientific literature
8. Execute the scientific method using reproducible research methods
9. Effectively communicate scientific research results through oral and written presentations

Required Textbooks

- SimUText Ecology
- Recommended: McMillan, V.E. 2012. *Writing Papers in the Biological Sciences*. 5th ed. New York: Bedford/St. Martin's
- Recommended: Molles, Jr., M.C. *Ecology: Concepts and Applications*.

Attendance Policy

Regular attendance and participation in class is critical to your success. This course will be offered in a hybrid format. Lectures will be convened online via synchronous Zoom meetings, and the textbook assignments will be conducted through an interactive online textbook. Lectures will be recorded and posted to D2L. The first five labs will require in-person activities in an outdoor setting. You will be working with small groups during each lab, and you will be required to wear a mask.

Students/faculty/staff displaying signs and symptoms compatible with COVID-19 (fever/chills, cough, shortness of breath, fatigue, body aches, headache, loss of smell/taste, sore throat, congestion, nausea/vomiting, diarrhea) will be asked to stay home and will be encouraged to self-isolate/seek medical attention.

Accommodations for Students with Disabilities

SCSU is an affirmative action, equal opportunity employer and educator. We are committed to a policy of nondiscrimination in employment and education opportunity and work to provide reasonable accommodations for all persons with disabilities. Accommodations are provided on an individualized, as-needed basis, determined through appropriate documentation of need. Please contact Student Accessibility Services (SAS), sas@stcloudstate.edu or 320-308-4080, Centennial Hall 202, to meet and discuss reasonable and appropriate accommodations.

Respect for Diversity

It is my intent that students from diverse backgrounds and perspectives be well-served by this course, and that the diversity that students bring to this class be viewed as a resource. Please let me know ways to improve the effectiveness of the course for you, personally, or for other students or student groups. As a student in this class, you are required to treat other members of the class with respect and kindness. Disrespectful, rude, or exclusive behavior will not be tolerated.

GRADES

| Category | Item | Details | % |
|-------------------|-----------------------|------------------------------------|-----------|
| SimUText Readings | | various dates | 10 |
| Lecture Exams | | | |
| | Exam 1 | Sept. 30; Unit 1 material | 15 |
| | Exam 2 | Nov. 4; Unit 2 material | 15 |
| | Final Exam | Dec. 16; 66% Unit 3; 34% Units 1&2 | 20 |
| Laboratory | | | |
| | Data Sheets | Sept. 24 | 5 |
| | Data Appendix | Oct. 8 | 5 |
| | Lightning Talk | Nov. 5 | 10 |
| | Research Poster Draft | Dec. 3 | 5 |
| | Research Poster Final | Dec. 10 | 10 |
| | Peer Feedback | various dates | 5 |
| | | | Total 100 |

SIMUTEXT READINGS are from the interactive textbook for this class, and each module has integrated, feedback-focused questions followed by a series of graded questions. **You are expected to have read that day's SimUText material prior to coming to class.**

SimUText graded questions are due by 10:00pm on the due date, which is usually Friday (see schedule). You may work through the SimUText material with your peers; however, mastering the material is your individual responsibility.

LECTURE EXAMS will be of variable format, including—but not limited to—multiple choice, true/false, matching, short answer, and brief essays. All exams will be somewhat cumulative but will primarily focus on the associated lecture and SimUText Unit material (see table above); in addition, the final exam will be ~25% cumulative.

| Percentage | Grade |
|------------|-------|
| ≥ 93 | A |
| 90-92.9 | A- |
| 87-89.9 | B+ |
| 83-86.9 | B |
| 80-82.9 | B- |
| 77-79.9 | C+ |
| 73-76.9 | C |
| 70-72.9 | C- |
| 67-69.9 | D+ |
| 60-66.9 | D |
| < 60 | F |

LABORATORY grades will be based around a semester-long group research project that will begin with collecting data in the field, continue with data entry, organization, and analysis, and culminate in oral and written presentations.

- Data sheets will be completed in the field during each of the first 5 labs. All data sheets will be due by end of the fifth lab, although I recommend that you hand in your datasheets at the end of each lab. I also highly recommend scanning in datasheets with your phone and emailing them to all group mates at the end of each lab.
- Data appendix will be an html document that includes summary statistics about each of the variables relevant to your research project and dataset. A template and further explanation will be provided later in the semester.
- Lightning talks will be given during lab. Your group will be allowed 3 slides and 5 minutes to present the main goal, result, and conclusion of your research project. You will be providing feedback to other groups, which will go toward your “Peer Feedback” grade, and you will be expected to incorporate feedback into your final poster presentation.
- Research poster must include title, introduction, methods, results, discussion, conclusions, and literature cited. A rubric for posters will be provided later this semester. Every group will present their poster draft in the penultimate lab session. You will be providing feedback to other groups on their posters, which will go towards your “Peer Feedback” grade, and you will be expected to incorporate feedback into your final poster.
- The final (virtual) research poster presentation will be open to friends and family outside of the class.
- Your peer assessment grade will include the quality of your formal feedback during the lightning talks and the draft poster presentation (33% each) and the grade that your group mates give you at the culmination of the semester (34%).

PARTICIPATION in class and lab will not go towards your grade directly. However, a record throughout the semester of exemplary participation and attendance can help in the case of a borderline final grade. Active participation also nurtures learning, and will improve the quality of future recommendation letters from your instructors.

Academic Integrity

Academic misconduct includes but is not limited to:

- cheating: using a resource other than one's own work to answer questions;
- plagiarism: misrepresenting another's ideas as one's own or not giving credit to the creator of a work;
- falsification: submitting falsified or fabricated information;
- facilitating others' violations: knowingly permitting or facilitating the dishonesty of others;
- impeding: placing barriers in the way of others' academic pursuits"

As a student at St. Cloud State University and as a student in this class, you are expected to fully and properly acknowledge the work of others. Every instance of plagiarism will be reported, as per the policies of the college, but please do not hesitate to ask me in advance if you think something might be questionable or if you are unsure about what is considered to be plagiarism. I am happy to help, as long as you inquire in advance!

Course Schedule (version dated 8/14/2020)

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|--------------------|--|--|--|
| <div>Aug 24th</div> First day of class | 25th | 26th Topic: Introduction to Ecology | 27th Lab: Warner Lake Park and Clearwater Riverside Park | 28th Topic: Experimental Design <i>SimUText Unit 1: Understanding Experimental Design Due 10pm</i> |
| 31st Topic: Evolution for Ecology 1 | <div>Sep 1st</div> | 2nd Topic: Evolution for Ecology 2 | 3rd Lab: St. John's Arboretum | 4th Topic: Evolution for Ecology 3 <i>SimUText Unit 1: Evolution for Ecology 1-3 due 10pm</i> |
| 7th <i>No class</i> | 8th | 9th Topic: Biogeography 3 | 10th Lab: Rockville Park | 11th Topic: t-test, ANOVA, regression <i>SimUText Unit 1: Biogeography 3 due 10pm</i> |

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|--|---------|--|--|--|
| 14th Topic: Behavioral Ecology 1 | 15th | 16th Topic: Behavioral Ecology 2 | 17th Lab: Kraemer Lake Park | 18th Topic: Biogeography 4 <i>SimUText Unit 1: Behavioral Ecology 1-2, Biogeography 4 due 10pm</i> |
| 21st Topic: Physiological Ecology 1 | 22nd | 23rd Topic: Physiological Ecology 2 | 24th Lab: Warner Lake Park and Clearwater Riverside Park | 25th Topic: Physiological Ecology 3 <i>SimUText Unit 1: Physiological Ecology 1-3 due 10pm</i> |
| 28th Topic: Wrap-up and review | 29th | 30th Exam 1 | Oct 1st Lab: Introduction to R & How Diseases Spread | 2nd Topic: Physiological Ecology 4 <i>SimUText Unit 2: Physiological Ecology 4 due 10pm</i> |
| 5th Topic: Ecosystem Ecology 1-2 | 6th | 7th Topic: Ecosystem Ecology 3-4 | 8th Lab: Data Appendix due 10pm (OSF) <i>SimUText Lab: How Diseases Spread due 10pm</i> | 9th <i>No class</i> <i>SimUText Unit 2: Ecosystem Ecology 1-4 due 10pm</i> |
| 12th Topic: Nutrient Cycling 1-2 | 13th | 14th Topic: Nutrient Cycling 3 | 15th Lab: Data analysis | 16th Topic: Nutrient Cycling 4 <i>SimUText Unit 2: Nutrient Cycling 1-4 due 10pm</i> |

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|---------|---|--|--|
| 19th Topic: Life History 1-2 | 20th | 21st Topic: Life History 3 | 22nd Lab: Understanding Population Growth | 23rd Topic: Life History 4 <i>SimUText Unit 2: Life History 1-4 due 10pm</i> |
| 26th Topic: Population Growth 1 | 27th | 28th Topic: Population Growth 2 | 29th Lab: Data analysis <i>SimUText Lab: Understanding Population Growth due 10pm</i> | 30th Topic: Population Growth 3 <i>SimUText Unit 2: Population Growth 1-3 due 10pm</i> |
| Nov 2nd Topic: Wrap-up and review | 3rd | 4th Exam 2 | 5th Lab: Lightning Talks | 6th Topic: Metapopulations (Pop'n Growth 4, Biogeography 1-2) <i>SimUText Unit 3: Metapopulations (Pop'n Growth 4, Biogeography 1-2) due 10pm</i> |
| 9th Topic: Community Dynamics 1-2 | 10th | 11th <i>No class</i> | 12th Lab: Keystone Species | 13th Topic: Community Dynamics 3-4 <i>SimUText Unit 3: Community Dynamics 1-4 due 10pm</i> |
| 16th Topic: Competition 1-2 | 17th | 18th Topic: Competition 3 | 19th Lab: Work on posters <i>SimUText Lab: Keystone Species due 10pm</i> | 20th Topic: Topic: Competition 4 <i>SimUText Unit 3: Competition 1-4 due 10pm</i> |

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|--|--|--|--|
| 23rd Topic: Competition 4 (cont.) | 24th | 25th <i>No class</i> | 26th <i>No class</i> | 27th <i>No class</i> |
| 30th Topic: Exploitation 1-2 | Dec 1st Topic: Exploitation 3 | 2nd | 3rd Lab: Draft Poster Presentations | 4th Topic: Topic: Exploitation 4 <i>SimUText Unit 3:</i> <i>Exploitation 1-4</i> <i>due 10pm</i> |
| 7th Topic: Climate Change video | 8th | 9th Topic: Climate Change (cont.) | 10th Lab: Poster Presentations | 11th Topic: Wrap-up and review |
| 14th | 15th | 16th FINAL EXAM 9:55am - 12:10am | 17th | 18th |