

Ecology Lab (Biology 204)
Spring 2022
Section 2: Monday 1:30-4:20 pm
Section 3: Wednesday 1:00 – 3:50 pm
ISC 107

The ecology laboratory is designed to complement the second-year ecology course, Principles of Ecology (Biology 203). Laboratories will consist of research projects that address questions at each level of ecological organization, from organisms to populations, communities, and ecosystems. Emphasis is placed on the types of research questions and designs used by a variety of sub-disciplines of ecology to expose students to the diverse nature of this field. Students will be engaged in all aspects of the development of an ecological study: making observations, formulating hypotheses and predictions, designing experiments and strategies for data collection, statistical and graphical analysis, interpreting results, and reporting findings in written and oral formats.

Instructor: Ms. Regina Clinton
e-mail: clinton@geneseo.edu

Office: ISC 139

Phone: 245-6051
Lab: ISC 107

Virtual or in-person Office hours: M 11:30 am -12:30 pm
T & R 2:30 - 3:30 pm
Other times by appointment

Click on zoom link below for online office hours

Join Zoom Meeting

<https://geneseo.zoom.us/j/88662113333?pwd=d2krUHKycFNGNFBibVR5VEpaU2Z5UT09>

Meeting ID: 886 6211 3333

Passcode: 400152

Required texts:

A Field Guide to Eastern Forests by John Kricher (Houghton Mifflin, 1998)

Primer in Biological Data Analysis by Gregg Hartvigsen (Ingram Publishing)

ISBN 9780231166997 or 9780231202138

Learning Outcomes

Successful students will be able to:

- make observations, generate hypotheses and carry out simple experiments and/or collect field data to answer questions from different sub-disciplines in ecology
- collect, organize, analyze and present ecological data using appropriate sampling methods, instrumentation, quantitative statistical and graphical analyses
- explore and evaluate the primary ecological literature to provide background information for your studies as well as to help put your results into the context of other ecological research

- communicate their findings using the conventions of scientific writing in reports which include:
 - 1) *Introduction* - identifies the context for the work, citing previous research
 - 2) Description of *Methods*
 - 3) *Results* including figures, tables, and statistics
 - 4) *Discussion* clearly identifies and explains the key results and their significance

Course Organization

Working in groups of four, students will cooperate to set up and run experiments or make observations, collect data, and prepare a formal lab report for each of the four projects done over the course of the semester. Because some projects require more time and steps than others, we may be engaged in several projects at one time.

Overview of Projects

Project 1 Auburn Squirrel Project (Behavioral ecology) – You will participate in a citizen science project on gray squirrels. Independently you will collect weekly data on the Eastern gray squirrel.

Project 2 Forest communities (Community ecology) – We will learn how to quantitatively describe a forest community using plot and plot-less sampling techniques. We will calculate diversity indices and standard measures of plant community structure to compare forest composition and structure in at least two contrasting environments in a local forest stand.

Project 3 Soil CO₂ emission (Ecosystem ecology) – In a forested ecosystem, we will investigate factors that affect soil CO₂ emission, a process that results from both root respiration and decomposition of organic matter in soils. Using the soda-lime method we will determine the effects of particular microclimate or soil characteristics on the rate of CO₂ emission in a field incubation experiment.

Expectations

Throughout this lab we will be developing your skills in writing lab reports; employing the conventions of scientific writing for each of the projects described above. The components of each report include the following sections, along with a descriptive project title and literature cited.

1. Introduction
2. Methods
3. Results
4. Discussion

All members of the group will participate in the design of each project, as well as the collection and analysis of data. All lab reports will be written as a group (25 pts + 10 pts data analysis + 10 pts peer evaluation). It is in everyone's best interest that your group establishes a good working relationship, which will sometimes involve meeting outside of lab time.

For each of the projects you will analyze and interpret your data, and will present your results together in a Powerpoint presentation. Data analysis assignments will give you practice analyzing and interpreting data, preparing figures, and describing/defending your results to your peers.

All files (Excel spreadsheets, R code, .csv files referred to in R code, etc.) used for analyzing your data must be submitted by the dates indicated so that the instructor can check your analyses and provide feedback before your presentations. After the submission of each group assignment and again at the end of the course, everyone will complete a form evaluating the participation of their peers and describing their own contributions, which will contribute to determining the participation grade earned by each student.

Course Evaluation (*Percentages are approximates*)

Group Lab Reports **35%** (Forest communities, Soil CO₂ emissions and Squirrel reports)

Quizzes **20%** (In-lab and On-line)

Data analysis **20%** (Group and Individual data analysis)

Participation/Presentations **25%** (includes preparedness, peer evaluation, in-class assignments, engagement in lab work, timeliness of assignments, organization & effectiveness of the PowerPoint presentations)

Course Policies

Lab attendance.

In the context of the COVID-19 pandemic, it is vital that we all do what we can to protect the health and safety of each other. In-person meetings present the highest risk of contagion. If you are feeling unwell on a day that class meets in-person, do not attend. Remember that it is better to stay home if you are not feeling well, than to attend class and risk spreading illness to others. Throughout the semester, please be proactive in communicating about absences and contact the Dean of Students if you expect to be out for an extended period of time.

Un-excused absences will **not** affect your grade. You must however, contact me *before* lab to inform me of your absence and set up a time to discuss any missed materials. You should also, contact your group members regarding the lab to learn what you will be responsible for on any group assignments.

The college has developed an online COVID-19 screening report for students. Be sure to familiarize yourself with this process and complete the brief screening report before leaving for class. If you are experiencing common symptoms of COVID-19, stay home and contact Health and Counseling Services as soon as possible. I strongly encourage you to set a daily reminder to fill out the screening report.

Lab preparation. You are expected to pay attention to the syllabus, emails from me, and posted announcements on Canvas and come prepared for each day's planned activities. If we are doing a field-based activity, you should be dressed for the weather with appropriate outerwear and shoes that can get muddy or wet – it is your responsibility to check the weather conditions and use your judgment about what to wear. Bring all lab-related handouts to each lab session (especially previously collected data), and when requested, bring your laptops. Sometimes plans for a lab

session may change at the last minute because of the weather; you should make sure to check your email on the day of a lab to find out any changes. Please be courteous to the instructor and your classmates by arriving on time, particularly on field trip days.

Online Quizzes

All online quizzes will be due on Mondays at 7:00 pm.

There are *no* make-up quizzes or re-opening quizzes for students that “forgot” a deadline. You are responsible for your success in the lab, and timeliness of assignments is part of that.

Quiz Mechanics:

- All Quizzes are timed (20 minutes). Please inform me by the end of the first week in lab of any requirements (letters of accommodation, additional time, etc.) that will assist with the learning process.
- Make sure you have a good connection before opening your quiz, as your quiz will be submitted if the connection is lost.
- Backtracking is *not* allowed on quizzes. Once you have moved to the next question in the quiz, you will *not* be allowed to go back to any prior questions.

Lab safety.

Face masks covering your mouth *and* nose are required at *all times* in the lab; this includes riding in vehicles or while in the field. If you forget your mask, please be sure to pick up a disposable one before entering the classroom. Masks must be worn for the duration of lab. If you do not have a mask or are unwilling to wear one, you will be asked to leave the lab. We cannot safely hold class if students are not wearing face masks.

If you would feel more comfortable or if my teaching could be more accessible if we wear a clear face mask, please let me know as soon as possible. Students who have concerns about wearing a face mask due to a documented disability need to contact the Office of Accessibility Services (access@geneseo.edu) to request reasonable accommodations

Inform me of any allergies or medical conditions that could require emergency treatment. While in the field you could experience exposure to mosquitoes, ticks, biting/stinging insects, and poison ivy, so be aware of these risks.

Dress appropriately for the weather and terrain, bring water, and carry required medications (allergy medication, inhaler, *EpiPen*, etc.).

Office hours and email. All office hours will be conducted virtually. I am happy to meet with you outside of my regularly scheduled office hours. Email me with possible times that you are available and I will respond with a time that we could meet. I will try to respond within 24 hours, but note that I have a number of campus commitments, so do not expect an immediate response. If you are emailing me about a problem with R, be very specific about your problem. Send me your complete R code and excel file (.csv) attach to your email.

Group dynamics. Success in this course depends to a large degree on effective collaboration and communication with group members. If your group is having problems working together, please

alert me as soon as possible so that we can resolve issues you are experiencing. Procrastination on assignments is often at the root of difficulties, so make an effort to get started early. It only creates stress for yourself and group members when trying to complete an assignment at the last minute.

Student code of conduct

Plagiarism and academic dishonesty. Plagiarism and other forms of academic dishonesty (e.g., copying work from another student) will not be tolerated. According to the Student Code of Conduct (http://www.geneseo.edu/dean_office/dishonesty), “plagiarism shall be considered to be deliberate representation of someone else’s words or ideas as one’s own or the deliberate arrangement of someone else’s material(s) as one’s own.” Read this code to understand the consequences of all forms of academic dishonesty. Take care to properly cite sources of ideas, figures, data, etc. (including internet sources) in your writing and presentations. Even if you properly cite your source, when you borrow wording and sentence structure from the original source and pass it off as your own (i.e., by not using quotation marks), you are guilty of plagiarism. Learn how to paraphrase in your own words information from the original source.

Copyright statement. Many of the materials that are provided to students in this course have been created by Dr. Apple. It would be best to assume that all course materials are protected by legal copyright. Copyright protection means that reproduction of this material is prohibited without the author’s consent. Thus, ***students are prohibited from sharing or posting any and all material to any websites outside our course Canvas site.*** Students are also prohibited from reproducing material to be shared with other more limited groups (e.g., sorority/fraternity test bank). Be aware that UUP (Union of University Professionals, the union representing faculty on this campus) is seeking to take legal action against these and other sites, and that posting or selling copies of materials to such sites may put a student in legal jeopardy.

Student Success Resources

Click on the link below to learn about academic support services (tutoring and learning centers), disability accommodations, library research and technology assistance, and general information about well-being. <https://wiki.geneseo.edu/display/PROVOST/Syllabus+Resources+Related+to+Student+Success>

Accommodations

SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will also be made for medical conditions related to pregnancy or parenting. Students should contact the Office of Accessibility (Erwin Hall 22 or access@geneseo.edu or 585-245-5112) and their instructor to discuss needed accommodations as early as possible in the semester. Students with letters of accommodations should submit a letter to your faculty member at the beginning of the semester and discuss specific arrangements. This is especially important for the timed quizzes. Additional information on the Office of Accessibility is available at <https://www.geneseo.edu/accessibility-office>.

Mental health considerations

Diminished mental health, including significant stress, mood changes, excessive worry, or problems with eating and/or sleeping can interfere with optimal academic performance. The source of symptoms might be strictly related to your course work; if so, please speak with me. However, problems with relationships, family worries, loss, or a personal struggle or crisis can also contribute to decreased academic performance.

SUNY Geneseo provides mental health services to support the academic success of students. Counseling Services, a part of the Lauderdale Center for Student Health & Counseling, offers free, confidential psychological services to help you manage personal challenges that may threaten your well-being. Campus also has the Dean of Students and Career Services that can be very helpful to students.

Course schedule

Due to the global pandemic, and because we depend on weather and the schedules of living things to determine when and how to run our projects, the course schedule is subject to change. Welcome to the world of an ecologist!

Week #	Week of	Notes†	Activity	Individual Assignments‡ Online quizzes are <i>always</i> due Monday's at 7:00 pm	Group Assignments Due‡
1	31-Jan	Comp	Introduction to course; sign up for Auburn squirrel project; collect data for the project	Auburn University Squirrel Online Quiz #1 ; Find primary source on squirrel feeding behavior due Monday, Feb 7	
2	7-Feb	Comp/ FW	Squirrel Project: present primary literature on squirrel foraging behavior, develop squirrel study, Field trip to collect squirrel foraging data <i>on campus</i> .	Online Quiz #2 on lab report format and Pre-lab R assignment (due Mon, Feb 14); Install R and RStudio on your laptop; Week 1 Squirrel data collection due Feb 12 @ 11:59 pm.	Squirrel Lab Report Plan (5 pts) due week of Feb 14
	14-Feb	Comp	Diversity Summit: Wednesday, Feb 16	No lab this week Squirrel data collection Week 2 Squirrel data collection due Feb 19 @ 11:59 pm.	
3	21-Feb	Comp	Start statistics tutorial; Data Analysis #1	Data Analysis #1- due week of Feb 28; Online Poison Ivy Quiz (5 pts) and Online Quiz #3 on Kricher pp. 8-17, 26-38, 48-52, 58-62, 72-75, 77-90 reading (10 pts) due Feb 28. Week 3 Squirrel data collection due Feb 26 @ 11:59 pm.	
4	28-Feb	FW	Forest communities: field trip to learn tree ID and practice sampling method, collect data as a class	In lab - Field sampling and tree ID Quiz #4 due week of March 7. Week 4 Squirrel data collection due March 5 @ 11:59 pm.	Forest Communities Lab Report Plan (5 pts) due week of March 7
5	7-Mar	FW	Forest communities: field trip to carry out group projects- In lab Quiz	In lab - Stats Quiz #5 week of March 21; Week 5 Squirrel data collection due March 12 @ 11:59 pm.	
	14-Mar		Spring Break: No Lab	Week 6 Squirrel data collection due March 19 @ 11:59 pm.	
6	21-Mar	Comp	Forest communities: data analysis, plan report. In-lab Stats Quiz #5	Week 7 Squirrel data collection due March 26 @ 11:59 pm.	Forest Communities Data Analysis/ results presentation, Forest Communities complete lab report - 25 points: due week of March 28

Week #	Week of	Notes†	Activity	Individual Assignments‡ Online quizzes are <i>always</i> due Monday's at 7:00 pm	Group Assignments Due‡
7	28-Mar	Comp	Present Forest Results; Complete Part II of stats tutorial; prep for soil CO2 project; In lab quiz	Online Quiz #6 on Kricher pp. 414-436 and soil CO2 lab handout due Monday, April 4. Week 8 Squirrel data collection due April 2 @ 11:59 pm.	
8	4-Apr	FW	Soil CO2 emission: field trip to locate sites for soil CO2 emission study, understory plant and invertebrate sampling	Online Quiz #7 Soil CO2 Emissions Set-up/Retrieval due Monday, April 11; Week 9 Squirrel data collection due April 9 @ 11:59 pm.	Soil CO2 Emissions lab report plan 5 points: due Week of April 11
9	11-Apr	FW	Soil CO2 emission: field trip to set up experiment and collect soil samples; back in lab, complete statistics tutorial	Week 10 Squirrel data collection due April 16 @ 11:59 pm.	
10	18-Apr	Comp	Soil CO2 emission: Soil lab measurements; plan report	Week 11 Squirrel data collection due April 23 @ 11:59 pm.	Soil CO2 emissions Analysis/ results presentation and complete report- 10 pts, Present Soil CO2 emissions results
11	25-Apr	Comp	Present Soil CO2 results and review lab reports; Progress review of squirrel projects, Map Squirrel data in R	Last week of squirrel data collection: Week 12 Squirrel data collection due April 30 @ 11:59 pm.	
12	2-May	Comp	Squirrel Project: Auburn Squirrel Data Analysis and plan report		Squirrel Analysis/ results presentation (10 pts) and complete report 25 pts due week of May 9
13	9-May	Comp	Squirrel Project: Present Squirrel results and review lab reports		

† FW = field work: wear appropriate clothing & footwear for working outside – check weather; comp = bring your laptop computer to lab

‡ Readings refer to *A Field Guide to Eastern Forests* by John Kricher; assignments should be completed before lab period unless otherwise specified

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