

PLANT ECOLOGY SYLLABUS

Schedule & Syllabus are subject to change, make sure to check it often.

Meeting Times

Lecture: 8:30–9:50 am Monday & Thursday, Loree 024 (attendance is mandatory)

Labs: 1:00–5:00 pm, Monday, Tuesday, Wednesday, or Thursday (attendance is mandatory)

You may only attend your registered lab section. Meet where specified in the lab schedule or otherwise announced. Labs will begin the week of September 12.

Professor: Dr. Myla Aronson

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Office: Blake Hall 105

Office hours: by appointment

Lab/Field Instructors: Lucia Weinman, lucia.weinman@rutgers.edu

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COURSE DESCRIPTION

Ecology is the study of interrelationships between organisms and their biotic and abiotic environments. As a basic science, ecology informs us about the processes governing the patterns we observe in nature. From an applied perspective, it is critical that we understand ecology as it provides insights and solutions to many of the environmental issues we are confronted with in our daily lives. In this course, we will focus specifically on the ecology of plants. Plant ecology is the study of the distribution and abundance of plants and their interactions with the abiotic environment and other organisms. In this course, we will examine plant life histories, populations, communities, and plant-animal interactions (pollination, dispersal, herbivory). Labs includes experiments and field observations, and field trips with an exploration of plant biodiversity of the campus and region. Terrestrial systems are emphasized.

COURSE LEARNING GOALS

This course is an introduction to plant ecology. Through the lectures, readings, assignments, field trips, and computer labs you will gain a broader understanding of the key concepts in plant ecology and get experience in applying these concepts by collecting, analyzing, and interpreting data from several local plant communities.

- Students will learn and express an understanding of how evolution and factors such as resources, animal interactions, and competition affect plant life histories, numbers, distribution, and community dynamics, and how humans and plants interact.
- Given a New Jersey habitat, students will be able to predict likely plant communities and identify the dominant plant species within these habitats.
- Students will develop a comprehensive understanding of common field techniques to study plant communities.
- Students will develop a comprehensive understanding of techniques to analyze and visualize plant population and community.

- Students will learn to effectively communicate scientific findings by writing portions of scientific papers based on field and greenhouse experiments.

How you reach the learning goals in class will be assessed through the evaluation and grading of:

- In-class activities & quizzes
- Lecture exams
- Lab quizzes
- Lab assignments and reports

COURSE MATERIALS

Required Texts:

- Keddy, P.A. 2017. *Plant Ecology: Origins, Processes, Consequences*, 2nd Edition. Cambridge University Press. ISBN: 978-1107114234. On reserve at Chang Library.
- Collins, B.R., K.H. Anderson. 1994. *Plant Communities of New Jersey*. Rutgers University Press, New Brunswick, NJ. ISBN: 978-0813520711 (*on Canvas*)

Recommended Texts:

- Knisely, K. 2009. *A Student Handbook for Writing in Biology*, 3rd edition. Sinauer, Sunderland, MA. ISBN: 978-1429234917
- Newcomb, L. 1989. *Newcomb's Wildflower Guide*. Little, Brown and Company, Boston, MA. ISBN: 978-0316604420
- Petrides, G.A., J. Wehr. 1998. *A Field Guide to Eastern Trees*. Houghton Mifflin Harcourt. ISBN: 978-0395904558

How will you succeed in this course?

- Attend all lectures and labs.
- Take notes on paper, not just on your computer (studies show that students retain more knowledge when hand-writing their notes)
- Complete and review all readings *before* the lecture or lab for which they are assigned.
- Meet all deadlines.
- Give yourself plenty of time to review the readings and notes before each exam.
- Take advantage of office hours!

COURSE POLICIES

Covid-19

Face coverings are required in all indoor teaching spaces, libraries, and clinical settings. Compliance is mandatory. You will not be allowed to attend lecture or lab without a face covering, and this will be counted as an unexcused absence.

See Rutgers policies: <https://coronavirus.rutgers.edu/covid-19-protocols-updated-june-2022/>

Stay home if you are sick – report yourself on the on Rutgers’ Self-reporting absence system: <https://sims.rutgers.edu/ssra/> and contact Dr. Aronson (for lecture) and your TA (for lab) **before the beginning of class**.

Attendance

Lecture and lab attendance are mandatory. Attendance will be taken at both within the first 5 minutes of class. If you are later than 5 minutes, you will not be counted in the attendance. If you miss more than ONE lab with or without a valid excuse, you will automatically lose 5% off your final grade. If you miss a class period (either lecture or lab), you must, in addition to emailing your lab instructors and/or Dr. Aronson, report yourself absent on Rutgers’ Self-reporting absence system: <https://sims.rutgers.edu/ssra/>.

There are NO MAKE-UP LABS so don’t miss your lab period! You may not “just” attend another lab section, we have strict restrictions on the number of students in the labs, as designated by the University. It is urgent that you are ON-TIME for field trips; If an emergency arises, contact your TA immediately for lab and Dr. Aronson for lecture. To qualify for special consideration, all excuses must be submitted by email to your TA (for labs) or to Dr. Aronson (lecture) with supporting documentation (i.e., medical note, army drill notice, etc), **BEFORE** the missed class period. Whether or not special consideration is given is entirely at the discretion of Dr. Aronson. *Excuses without supporting documentation will not be granted.*

Assessment

- Lecture (50% of final grade)
 - Three **exams** will cover material from lecture, lab, and readings (10% first and second exam each, 15% final exam, total of 35% of final grade). Approximately 25% of the 2nd and final exams will be cumulative.
 - Lecture **assignments** (10% of final grade). These are designed to increase your understanding of particularly challenging topics and/or to reiterate important concepts. There are no make-ups. These quizzes/assignments will be due by 5:00 pm the day they are assigned (see lecture schedule).
 - **Attendance** (5% of final grade). Attendance will be taken in the first 5 minutes of class. If you are later than that, you will be marked absent.
- Lab (50% of final grade)
 - Assignments, lab reports, and quizzes

Late Assignment Policy: There are no make-ups for quizzes or exams. Lab assignments will be penalized. 10% will be deducted for each day the assignment is late. If still late after 3 days, the assignment will not be graded, and you will receive a zero for that assignment (unless otherwise

stated by the instructors). Assignments, quizzes, or exams missed not based on illness or excused emergencies will result in a zero grade, and that grade cannot be changed.

No extra credit will be awarded.

To be fair, we ask that any requests for grade changes must be in writing, over email within **one week** of receiving your grade for that assignment/exam.

For assignments and lab reports, points will be taken off for misspellings, wrongly formatted text, sloppiness, not adhering to given formatting guidelines, and similar mistakes. See the lab report guidelines on Sakai. We will use gradebook on Canvas so you can check your current grade at all times. If you feel like you are falling behind, come and talk to us about ways to improve your performance. We are here to help you learn!

Assessment Scale:

A: 90.0-99%; B+: 85.0-89.9 %; B: 80.0-84.9 %; C+: 75.0-79.9 %; C: 70.0-74.9 %; D: 60.0-69.9 %; F: < 60%.

There will be no curving of grades.

Academic Conduct and Integrity

Quizzes and Exams are expected to be taken individually, not with anyone else. Anything otherwise will be considered cheating and will be reported.

Write everything by yourself, in your own words, and never copy text from the internet or publications – we are using turnitin.com to check assignments and lab reports. Please remember to cite all sources for information (see lab manual). Reference lists have to include all authors and full title of each paper. Each student has the responsibility: (1) to uphold the highest standards of academic integrity in the student's own work; (2) to refuse to tolerate violations of academic integrity in the university community; and (3) to foster a high sense of integrity and social responsibility on the part of the university community.

Cheating and Plagiarism: Plagiarism is defined as the use of any information, published or unpublished, without acknowledgement of the source. Copying sentences without quotations but with citations, is also considered plagiarism. Cheating is a special form of plagiarism that occurs when you use the work of another student in place of your own or when you share answers or questions when explicitly told not to. Violations are always reported to the Dean's Office, under University rules. It is extremely important that you distinguish your own ideas from those of others. Your sources must always be acknowledged.

Notice for Students with Disabilities

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. To begin this process, please complete the Registration form

on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>. There will be no accommodations given until you have the proper documentation from ODS.

Academic Support

The Office of Academic Programs is open to assist SEBS students. Students are welcome to walk into Martin Hall (Room 109), call (848-932-3000 x2), or use the Online Chat (sebs.rutgers.edu/advising) during business hours (M-F, 8:30-5) for assistance. To support social distancing guidelines and reduce bus traffic, they are happy to assist students with registration issues via phone and Chat. If you are not a SEBS student, please check whether walk-in access is available with other New Brunswick advising offices' websites.

Basic Needs Security

If you face challenges securing food or housing or experience mental health, domestic abuse, or substance use issues and this may affect your performance in the course, I urge you to check Rutgers Student Health Services [webpage](#) for resources to address these issues. I encourage you to contact Student Health Services directly ([hours of service](#)) at 848-932-7402 and/or counseling services at 842-932-7884. You can also call or visit [NJ 211](#); a database/website containing detailed descriptions of available programs and services that are provided by local community groups, social service and health-related agencies, government organizations, and others. If you feel comfortable, please notify me, so I can be aware of your circumstances and offer any helpful resources.

LECTURE SCHEDULE (*subject to revisions*)

Lectures are in-person. Attendance will be taken. All assignments must be uploaded to canvas by 11:59pm the day they are due.

All readings for lecture unless otherwise stated are from Keddy (2017). Collins & Anderson is the Plant Communities of New Jersey book and I have provided scans of the chapters on Canvas. Readings may be added throughout the semester.

Date			Topics	Readings
September	Thurs	8	Introduction to the course The science of plant ecology <i>Assignment: Dichotomous keys</i>	
	Mon	12	Plant identification and life histories	Chapter 2, pages 36-47 (Section 2.2 - Functional Classifications are Based of Ecological Traits); Chapter 9, pages 358-360 (Section 9.9 - Plant Life Spans); Chapter 10, pages 402-406 (Section 10.8.6 - The CSR Synthesis). Plant Identification Basics pdf (on Canvas).
	Thurs	15	<i>Assignment: Plant Identification and Drawing</i>	
	Mon	19	Resources: Light & Soil	Collins & Anderson, Chapters 1-2
	Thurs	22	Global biodiversity	Chapter 1 (Section 1.1.4 Vegetation Types & Climate); Chapter 2 (Sections 2.2.2-2.2.3, 2.3.6, Conclusion); Chapter 10 (Sections 10.2-10.4) https://climate.ncsu.edu/edu/AtmosCirculation Ellis & Ramankutty 2008
	Mon	26	<i>Assignment: Local & regional vegetation types</i>	
	Thurs	29	Urban Plant Ecology	TBA
	Mon	3	Community properties	Chapter 11 (Sections 11.1-11.3); pages 435-440 (Section 11.5.1 Clements and Gleason). Chapter 12 (Sections 12.1 - 12.5, 12.7).
	Thurs	6	<i>Species diversity assignment due</i>	
	Mon	10	EXAM 1	
	Thurs	13	Succession and disturbance	Chapter 5; Chapter 8, 322-336 (Section 8.4 Hundreds of Years: Succession) Collins & Anderson, Ch. 7
	Mon	17	Population structure and dynamics I	Chapter 9
	Thurs	20	Population structure and dynamics II <i>Population assignment due</i>	Chapter 9
	Mon	24	Plant reproduction & pollination	Chapter 8, pages 276-283 (Section 7.4 - Positive Interactions Between Plants and

Nov	Thurs	27	Seed ecology and dispersal	Animals: Part 1 Pollination), 351-354 (Section 9.6 - Clones and Genets). Chapter 7, pages 283-289 (Section 7.5 - Positive Interactions Between Plants and Animals: Part 2 Seed Dispersal); Chapter 8, pages 343-351, (Section 9.3 - How Many Seeds Will a Plant Produce?; Section 9.5 - What Determines the Size of Seeds). Ant dispersal: https://www.sciencemag.org/news/2020/08/do-n-t-crush-ant-it-could-plant-wildflower# (Links to an external site.) and on Canvas
	Mon	31	Invasive species	Pick 3 invasive species to read about here: https://www.invasivespeciesinfo.gov/terrestrial/plants
	Thurs	3	<i>Invasive species assignment due</i>	
	Mon	7	EXAM 2	
	Thurs	10	Competition I	Chapter 4
	Mon	14	Competition II	Chapter 4
	Thurs	17	Herbivory	Chapter 6
	Mon	15	<i>Assignment – Ecological impacts of high deer densities</i>	
	Mon	21	Wetland plant ecology	TBA
	Tues (Thurs classes)	22	Plant evolutionary history	Chapter 1, (Sections 1.1 -1.2, 1.8-1.9); Chapter 2, pages 48-57 (Section 2.3: Phylogenetic Classifications are Based on Evolutionary History); Chapter 8, pages 300-312 (Section 8.1-8.2) https://www.sciencemag.org/news/2018/02/land-plants-arose-earlier-thought-and-may-have-had-bigger-impact-evolution-animals
	Thurs	24	Thanksgiving!	
	Mon	28	Plant evolution & adaptation	"Decent with modification" to "A case study of coevolution" to accompany today's lecture. https://evolution.berkeley.edu/evolibrary/article/evo_14
	Thurs	1	Urban plant evolution	Johnson et al. 2015, Johnson & Munshi-South 2017 pdfs (in Canvas)
	Mon	5	<i>Assignment – Arabidopsis adaptation</i>	
	Thurs	8	Restoration ecology	Chapter 13, pages 518-521; Handel 2013
	Mon	12	Conservation & Management <i>Conservation assignment due</i>	Chapter 13
	TBA		FINAL EXAM	

<https://data.nuggets.org/2019/09/testing-the-tolerance-of-invasive-plants/>

LABORATORY SCHEDULE (*subject to revisions*)

All labs begin **promptly** at the time specified in the lab schedule below and will end by 5:00pm. We go out to the field RAIN or SHINE! Meet where specified in the schedule below. Always bring a print-out of that day's lab, a notebook, and a writing utensil. Most labs are outdoors: dress appropriately for the weather, poison ivy, and ticks. **You must wear long pants and close-toed shoes.** You will **not** be able to attend the lab without appropriate clothing and you will not be given a chance to make-up the lab should you show up inappropriately dressed.

You will be running a plant germination experiment at home for the first half of the semester. For that experiment we are providing a kit of materials for you to pick up at lab during the week of Sept 12.

Make sure to read the lab information before each lab meeting so you are familiar with the lab. C&A = *Plant Communities of New Jersey* (1994) on Canvas. Readings may be added throughout the semester.

All assignments are due at 11:59pm the night before your lab section's next meeting (for example, if your lab is on Mondays, the assignment from the week before is due Sunday at 11:59pm).

Week of	Topic	Location	Readings	Assignments
Sept 12	Plant-Insect Interactions Start Germination Experiment	1:00pm: in front of ENR building. <i>Online quiz – Plant Communities of NJ: Ch 1-2</i>	https://xerces.org/eart h-week-urban-hag	
Sept 19	Field Trip: Ecological succession & forest ecology	1:30pm: Hutcheson Memorial Forest, 2150 Amwell Rd Somerset, NJ <i>Online quiz – Plant Communities of NJ: Ch 7</i>	C&A: Ch. 7	Plant-Insect interactions assignment
Sept 26	Forest ecology I – data collection	1:00pm: Ecological Preserve, Livingston Campus		Field Plant ID Quiz 1
Oct 3	Forest ecology II – data analysis	1:00pm: Online, synchronous <i>Online quiz – Plant Communities of NJ: Ch 3-5</i>		Online Plant ID Quiz 1
Oct 10	Field Trip: Pinelands ecosystems	1:30pm: Jamesburg Park Conservation Area <i>Online quiz – Plant Communities of NJ: Ch 9-10</i>	C&A: Ch. 9-10	Forest ecology assignment due
Oct 17	Field Trip: Salt marshes & coastal dunes	1:45 pm: Sandy Hook, Gateway National Recreation Area, Lot E <i>Online quiz – Plant Communities of NJ: Ch 12-13</i>	C&A: Ch. 12-13	Field Quiz 2 *Germination data due
Oct 24	Germination experiment data analysis	1:00pm: Online, synchronous		Sandy Hook assignment due

Oct 31	Climate change and sources of data	1:00pm: Online, synchronous	https://e360.yale.edu/features/as-climate-warms-a-rearrangement-of-worlds-plant-life-looms	Germination experiment assignment due
Nov 7	Greenhouse tour Herbarium tour & literature sources	1:00pm: Floriculture Greenhouses		Field Quiz 3 Climate Change assignment due
Nov 14	Herbarium research project introduction and methods development	1:00pm: Online, synchronous		
Nov 21	NO LABS (<i>except for Monday lab</i>)			Herbarium methods due
Nov 28	Group meetings for Herbarium project work and TA consultations	1:00pm: Online, synchronous		
Dec 5	Herbaria project presentations	1:00pm: Online, synchronous		Presentations due

This syllabus and schedule is a guide for the course and is subject to change. We will email you through Canvas if any changes occur.