

Forest Biology Information Sheet and Syllabus

Bi 307, Spring, 2019 crn: 30960

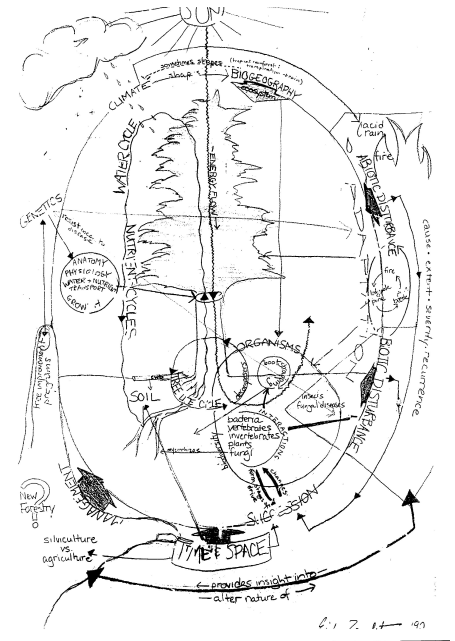
v. 3.13.19 -- subject to modification

In this lab/lecture/field course, we explore forest ecology and forest management from a biological perspective. The prerequisite for this course is Biology 213 or 283H or equivalent, or instructor's consent. I assume that you are familiar with concepts such as productivity and energy flow in ecosystems, nutrient cycling, species interactions, are comfortable with basic chemistry terms and concepts, and are willing to think critically and with an open mind about complex issues.

In addition to learning important concepts, we will discuss current issues, we'll get out in the forest to see first-hand examples of things we read about, and we will examine complex questions. You will be required to read, synthesize, analyze, and evaluate. All of this will take time and work.

Students who successfully complete this course will be able to:

- Recognize and name at least twenty local tree species by memory
- Use a dichotomous key to identify other woody shrubs or trees native to Oregon
- Explain why forests are found in certain areas, and why conifers are so prevalent in the PNW
- Explain how forest communities have changed over ecological time in response to climate and project how forests might be altered with future climate change
- Explain how trees' internal anatomy is related to their physiological ecology
- Describe how nitrogen and carbon cycle within a forest and identify important fluxes and stores
- Explain the role of seemingly inconsequential organisms including bacteria, fungi, nematodes, and microarthropods.
- Explain the roles of fire, disease, and insects in different forest types
- Explain the similarities and differences in genetic breeding programs in silviculture and agriculture
- Evaluate complex claims about forest management practices and express opinions using credible scientific evidence
- Be comfortable with uncertainty and complexity in answering questions about forest management
- Remain appreciative of the aesthetic values of forests while simultaneously having a better understanding of the biological processes that shape them.



Staff	email	office hours	location
Alan Dickman	adickman@uoregon.edu	Monday 11:30am to 1pm; during lab; and by appt.	137 HUE
Felipe Campos-Cerda (GE)	fcamposc@uoregon.edu	Thursday 1 - 2 pm	32 KLA
Everette Somers (BULA, BTU)	everette@uoregon.edu	Tuesday 4 -5 pm in lab	111 HUE

Lecture: Monday and Wednesday: 10:00 to 11:20 AM, Straub 252

Lab: Tuesday 1 to 4 pm, room 111 Huestis

Field trips: You are welcome and encouraged to attend all field trips, but you must attend and write journals for at least two field trips to earn full credit for the field trip portion of the class grade.

- **Saturday April 6** Introduction to Forests of the western Cascades. Depart at 8:30AM, return ~ 6PM
- **Sunday April 28** Research at H.J. Andrews Experimental Forest. Depart 8:30 AM, return ~ 6PM
- **Saturday May 18** Forest Management on Private Land. Depart 8:30 AM, return ~ 6PM.
- **Tuesday, June 4** Tyrrell Seed Orchard. Depart at 1PM, return ~ 6PM

Lab Exam: in lab during week nine of course (May 28)

Final Exam: 10:15 am, Wednesday, June 12, 252 Straub Hall

Wk	Date	Topic	Readings	Lab/Field/Assignments
1	4/1	1) Introduction to Forest Biology and Forests of the PNW	Spies & Duncan; Old Growth in a New World Rapp; Science Update 1, Restoring Complexity	Lab 1: Use of Tree ID keys
	4/3	2) Forest Biogeography and long term ecosystem change	Waring Land of Giant Conifers Hebda & Whitlock Environmental History	Field Trip, Saturday April 6: West slope Cascade Forests collecting for later labs.
2	4/8	3) How trees grow	Cook Plant Growth (use as reference material)	Lab 2: Leaf and Stem Anatomy
	4/10	4) How trees get thick and how water moves	Wilson, The Growing Tree (not as long as it seems; use as reference material)	Cascades FT report due April 10
3	4/15	5) Soil and Water	Zimmerman, Piping Water to the Treetops Nardi on Soil: pp 1-10; 36-45	Lab 3: Campus Tree Walk dress to be outdoors; bring Manual of Oregon Trees and Shrubs
	4/17	6) Soils and Soil Processes	Nardi: Soil processes pp, 239-251	Homework Set #1 due April 16
4	4/22	7) Mycorrhizae and Nutrients	McCoullough Mycorrhizae Zimmer The Web Below Perry Cedar Camp Nardi: Mycorrhizae and Nutrients pp. 11-22	Lab 4: Wood Anatomy
	4/24	8) Nutrient Cycling in Forests and importance of Nitrogen	Barron Predatory Fungi Lovett Insect Defoliation and Nitrogen	Field Trip: Sunday, April 28 HJ Andrews Experimental Forest
5	4/29	9) Decomposition and Soil Organisms	Moldenke: Soil Arthropods Nardi: Organisms; Composting pp. 22-36; 47-67; 251-256	Lab 5: Microorganisms
	5/1	First Midterm Exam (1-8)		Homework Set #2 due April 30
6	5/6	11) Biomass and Productivity	Lehmann and Kleber Contentious Soil Carbon	Lab 6: Soil Fauna
	5/8	12) Carbon Cycling in forests	Ryan et al Forests and Carbon for US Forests	HJA FT report due May 8
7	5/13	13) Succession and Fire Ecology	Franklin Conserving OG Forests and Attributes Noss et al Managing Fire Prone Forests Kaufman: Perceptions of Fire, Land Use, Restoration	Lab 7: Alton Baker Tree Walk – dress to be outdoors, bring Manual of Oregon Trees and Shrubs
	5/15	14) Forest Diseases	Schowalter et al. Integrating Ecological Roles of Insects, Pathogens, and Mycorrhizae Betlejewski, Nelson, Shaw (use as reference material)	Field trip: Saturday May 18 Private land forest management
8	5/20	15) Forest Insects	Wickman, Fellin, Amman (use as reference material)	Optional - open lab review for lab exam and midterm
	5/22	Second Midterm Exam (8-15)		Homework Set #3 due 5/21
9	5/27	No class – Memorial Day		Lab Exam in lab, May 28
	5/29	17) Forest Genetics	Friedman Forest Genetics for Ecosystem Management	Management FT report due 5/29
10	6/3	18) Landscape Ecology	Rapp; SU 3, Dynamic Landscape Management Cissel Landscape Management using fire regimes Cornwall Against the Grain (Jerry Franklin)	June 4 Field Trip to BLM Tyrell Seed Orchard Replaces lab this week
	6/5	19) Synthesis	Spies et al. Conserving Old Growth in a New World Moore Spiritual Value of Old Growth Forests	Genetics FT report due June 7
11	6/12	Final Exam (Cumulative) 10:15 AM Wednesday, June 12, in Straub 252		

Red = exam or assignment; Green = outdoor activity

Assigned reading

(in the order we'll get to them in the class – does not include the excerpts from the Life in the Soil book,)

- Spies, Thomas, and Sally Duncan. 2009. **Searching for Old Growth**. Chapters 1-3 in *Old Growth in a New World*. Island Press.
- Rapp, Valerie. 2002. **Restoring Complexity: Second-Growth Forests and Habitat Diversity**. Science Update Issue 1, Pacific Northwest Research Station. <http://www.fs.fed.us/pnw/publications/sci-update.shtml>
- Waring, Richard H. 1983. **Land of the Giant Conifers**. Natural History. October, pp. 55-62.
- Hebda, Richard, J., and Cathy Whitlock. 1997. **Environmental History**, Chp. 9 in *The Rainforests of Home; Profile of a North American Bioregion*. edited by P.K. Schoonmaker et al. Island Press.
- Steve Cook. 2008. Plant Growth (read for lab, and bring to lab)
- Wilson, Brayton F. 1984. **The Growing Tree**. University of Massachusetts Press. Pages 1-28; 87-100; 121-127
- Zimmerman, Martin H. 1982. **Piping Water to the Treetops**. Natural History, July pp.6-13.
- McCullough, Patrick. 1998. **Mycorrhizae, your silent partner**. Western Arborist 24(4) <http://www.wcisa.net/magDetails.asp?MagazineID=8&Detail=1>
- Zimmer, Carl. 2001. **The web below**. Western Arborist 26(4). <http://www.wcisa.net/magDetails.asp?MagazineID=15&Detail=1>
- Perry, Dave, Ram Oren, and Stephen Hart. 2008 **Forest Ecosystems** 2nd edition. Johns Hopkins. (previously used textbook) selection on Cedar Camp, pages 453-456.
- Barron, G.L. 2003. **Predatory fungi, wood decay, and the carbon cycle**. Biodiversity, Volume 4:3-9. <http://www.uoguelph.ca/~gbarron/MISC2003/feb03.htm>
- Lovett, Gary M. et al. 2002. **Insect Defoliation and Nitrogen Cycling in Forests**. BioScience 52(4): 335-341.
- Moldenke, Andy. 2002. **The Soil Biology Primer**. chp 7. **Arthropods**. http://soils.usda.gov/sqi/concepts/soil_biology/arthropods.html
- Lehmann, Johannes and Markus Kleber. 2015. **The contentious nature of soil organic matter**. Nature 258 : 60-68.
- Ryan, M.G et al. 2010. **A Synthesis of the Science on Forests and Carbon for US Forests**. Issues in Ecology, report # 13. . http://esa.org/science_resources/issues.php
- Franklin, Jerry 2009. **Conserving Old Growth Forest and Attributes**. Chp. 22 in *Old Growth in a New World*.
- Noss, Reed, et al. 2006. **Managing fire-prone forests in the western United States**. Frontiers in Ecology and Environment 4(9):481-487.
- Schowalter et al. 1997. **Integrating the Ecological Roles of Phytophagous Insects, Plant Pathogens, and Mycorrhizae in Managed Forests**. Chp. 11 in *Creating a Forestry for the 21st Century*. edited by Kathryn A. Kohm and Jerry Franklin. Island Press.
- Use the following 6 as references to help with lecture material. Don't sweat the details that aren't stressed in lecture.
- Betlejewski, Goheen, Angwin, Sniezko. 2011 **Port Orford Cedar Root Disease**. USDA Forest Service. R6 FIDL 131. Available at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346825.pdf
- Nelson, Earl, N. Martin, and R. Williams. 1989. **Laminated root rot of western conifers**. FIDL #159. <http://www.fs.fed.us/r6/nr/fid/fidls/fidl159.htm>
- Shaw, David, 2008. Swiss needle cast of Douglas-fir in Oregon. Oregon State Extension Forest Health Fact Sheet. <http://www.oregon.gov/ODF/privateforests/docs/fh/SwissNeedleCast.pdf?ga=>
- Wickman, Boyd; Richard R. Mason and Galen C. Trostlel. Not dated. **Douglas-Fir Tussock Moth** U.S. Department of Agriculture Forest Service Forest Insect & Disease Leaflet 86. <http://www.fs.fed.us/r6/w-w/resources/dftm.htm>
- Fellin, David, and J. Dewey. 1982. **Western Spruce Budworm**. U.S. Department of Agriculture Forest Service. Forest Insect & Disease Leaflet 53 <http://www.na.fs.fed.us/spfo/pubs/fidls/westbw/fidl-wbw.htm>
- Amman, Gene, M. McGregor, and R. Dolph, Jr. 1989. **Mountain Pine Beetle**. U.S. Department of Agriculture Forest Service. Forest Insect & Disease Leaflet 2. <http://www.barkbeetles.org/mountain/fidl2.htm>
- Friedman, Sharon. 1997. **Forest Genetics for Ecosystem Management**. Chp 13 in *Creating a Forestry for the 21st Century*. edited by Kathryn A. Kohm and Jerry Franklin. Island Press.
- Rapp, Valerie. 2003. **Dynamic Landscape Management**. Science Update Issue 3, Pacific Northwest Research Station. <http://www.fs.fed.us/pnw/publications/sci-update.shtml>
- Cissel, J. H., F.J. Swanson, and P.J. Weisberg. 1999. **Landscape Management Using Historical Fire Regimes: Blue River, Oregon**. Ecological Applications 9(4): 1217-1231.
- Cornwall, W. 2017. **Against the Grain**. Science 358(6359), 24-27.
- Spies, Thomas, et al. 2009. **Conserving OG in a New World**. Chp. 27 in *Old Growth in a New World*. Island Press.
- Moore, Kathleen Dean. 2007. **In the Shadow of the Cedars: the Spiritual Values of Old-Growth Forests** Conservation Biology 21(4): 1120-1123
- And assigned pages in Nardi, James. 2007 **Life in the Soil**. University of Chicago Press.
- Several readings are chapters from **Old Growth in a New World, A Pacific Northwest Icon Reexamined**. 2009. Island Press
- I may adjust reading as we go along

Grading Criteria and my Grading Philosophy:

If you earn 70% or more of the total possible points, you are guaranteed a C; earn 80% and you receive at least a B-; earn 90% and receive at least an A-. I may lower these cutoffs, but I will not raise them. What does this mean for you? If you do satisfactory work (in my judgment), you earn a C, good work earns a B, and excellent work earns an A. I grade on performance, not on effort, but it is extremely rare that anyone who comes to class regularly, does the reading, and puts a serious effort into studying doesn't pass with a C or better.

Grade Criteria

<u>Component</u>	<u>Percent of total</u>
midterm exams (two @ 16% each)	32%
final exam	20%
lab exam	20%
homework	18%
<u>field trips and field notes</u>	<u>10%</u>
Total	100%

Classroom Conduct.

I expect everyone to follow University rules and guidelines for behavior. Academic dishonesty, which includes cheating and plagiarism, is a serious offense and will be treated according to the guidelines in the [student conduct code](#) (located at uodos.uoregon.edu). This doesn't mean you shouldn't talk with other students about what you are thinking or writing; it does mean that when you write something, it should be in your own words, not copied from someone else.

I ask that we all do our best to be intellectually honest while also being tolerant of personal differences. I welcome and encourage intellectual controversy--I think it is essential to real learning. At the same time, I ask that we all respect the rights of others to hold different opinions, even as we challenge the ideas supporting those opinions. I promise to value each of you as individuals; I view the grades you earn to be a reflection of the quality of work you do, but not of you as a person.

Out of respect for other students, and in keeping with departmental policy, you should plan to arrive at class on time and to stay until class is over. If, on occasion, you do arrive late, please be considerate of others and enter quietly at a time and in such a way that you don't disturb other students. If you need to leave early, please sit near an exit so that you can leave without disrupting the class. I ask that you not interfere with the ability of other students to learn by making noise, texting, checking email, etc. when someone else (instructor or classmate) is talking.

If you have a documented disability and anticipate needing accommodations in this course, please make arrangements with me soon.

Crises happen. If you have problems that interfere with your ability to do the work in this class, please let me know promptly. I am willing to make special arrangements when the need is real **and** when you have done your best to deal with the situation in a timely manner. The University of Oregon Counseling Center, provides students with confidential consultation 24 hours a day, 7 days a week. From 8-5 Monday through Friday you will be connected with the front desk, and after hours, the same number connects to their support line. **Their number is (541) 346-3227.** Students often believe that their issues are not "severe" enough for them to call, but at the Counseling Center, no problem is too small.

I welcome suggestions for ways to improve the class at anytime.

Lab Activities and Field Trips:

Lab activities are an important part of the course. It is not often possible to make-up a lab because they typically require special materials. If you know in advance that you have to miss a lab, contact me to see if you can make other arrangements. You will not turn in formal lab reports for this class, but some notes that you take in lab may be used on a portion of the lab exam.

There are four different field trips offered. You earn three points for attending and up to two points for a report for each trip. It is possible to earn the maximum points by attending any two field trips, but you are encouraged and invited to attend all four. Field trip reports should explain how things we have read about or discussed in lecture are manifested in the field. They should be approximately two pages (typed, double-spaced) and are due in lab the week following the field trip. We will travel in state vans and (unless otherwise instructed) will depart from the parking lot that is immediately behind (north of) the Onyx Bridge entrance to the Science Library. Dress for field conditions: it is usually a good idea to bring several layers of clothes -- more than you think you may need. If it has rained in the past week, be prepared for damp vegetation; umbrellas often work well, but rain coats, rain pants, and rubber boots are a good idea if it is really wet. **Bring any food and water you might want.** Markets and restrooms are rare to non-existent where we will be on many of our field trips.

Homework and late policies

There are three homework assignments. They are meant to help you study so as to do well on the exams. Do them as you go along, not all at the last minute. Each is worth 6% of your course grade. Late assignments will have ten percent deducted per day late. Homework may not be accepted after the exam, however (as it defeats the purpose).

Exams

Often you will be asked to apply or to synthesize information. This is harder than simply recalling facts. I do not give make-up exams, so note the dates of the exams and don't make plans to be gone on any of those dates. The final exam will be cumulative and is on Monday, June 11, at 10:15AM

How to do well in this course:

- Attend all class functions (lectures, labs, field trip), arrive on time, and participate actively
- Do the assigned reading. You don't have to read it thoroughly in advance, but skim the material so that you know what is there and can go back and read in more depth later.
- Use slides posted to Canvas for studying, but do not use these as a replacement for attending lectures.
- Ask questions.
- Get together with someone else in the class at least once a week to study. Without looking at notes, reconstruct the most important concepts studied in class that week. Then use your notes to fill in the gaps in your understanding.
- Ask yourself how what you are learning matters. If it isn't apparent, then ask. Pay attention to issues in the news that are relevant concepts covered in this course.
- Don't believe everything you hear or read; back up your own opinions with credible evidence and logic.
- Don't miss the forest for the trees; the big picture is essential.

Safe Ride is an **assault prevention shuttle** that works to provide free, inclusive, and accessible alternatives to traveling alone at night for **UO students, faculty, and staff**.

We are a schedule-ahead service and riders can (1) call once we open to schedule a ride with a dispatcher or (2) leave a voicemail on the day of their ride request. We do not call riders ahead of time to confirm due to capacity constraints, but riders are always welcome to call us to double-check that their ride was scheduled. We are a feminist, 'for-the-students/by-the-students' organization and operate out of the Women's Center in EMU 12F.

Operating hours:

Spring term	Sunday - Thursday 7p - midnight Friday + Saturday 7p - 2a
Summer term	Sunday - Thursday 9p - midnight Friday + Saturday 9p - 2a
Fall/Winter term	Sunday - Thursday 6p - midnight Friday + Saturday 6p - 2a

Policy and rules:

1. We are a **schedule-ahead service**, we **do not call ahead**, and we can only wait for riders for 5 minutes at their pick-up time and location.
2. We only give rides to groups of **3 or less** to prioritize groups that are at higher risk.
3. We are a **free service** and do not accept tips.