In this course, we explore forest ecology and management from a biological perspective. We will examine forests across levels of organization, from tree cells and physiology, to populations, to the many diverse interactions among species, up to ecosystem processes. This will involve examining details of organismal biology but also ‘zooming out’ to think about larger-scale forest processes. We will try to understand the dynamic nature of forests – how they change from place to place and over time. Because humans depend on and affect forests, we will reflect on our role in managing forests for the varied resources and biodiversity they contain. Prerequisites include familiarity with basic ecological concepts as well as basic chemistry terms and concepts. We will further expect you are willing and ready to think critically and approach complex topics with an open mind.

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 roles of seemingly inconsequential organisms including bacteria, fungi, nematodes, and microarthropods.
- Explain the roles of fire, disease, and insects in different forest types
- Explain the goals of genetic breeding programs in silviculture
- Evaluate 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.
<table>
<thead>
<tr>
<th>Wk</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Lab / Assignments</th>
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</table>
| 1  | 9/28  | 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                                                            |
|    | 9/30  | 2) Forest Biogeography and long term ecosystem change  | • Waring Land of Giant Conifers  
• Hebda & Whitlock Environmental History                                                    |                                                                                 |
| 2  | 10/5  | 3) How trees grow, get thick and how water moves | • Thomas Chapter 3                                                                           | Lab 2: Campus Tree Walk dress to be outdoors; bring Manual of Oregon Trees and Shrubs |
|    | 10/7  | 4) Soil Processes and Water                 | • Zimmerman, Piping Water to the Treetops  
• Nardi on Soil: pp 1-10; 36-45; 239-251                                                     |                                                                                 |
| 3  | 10/12 | 5) Mycorrhizae and Nutrients                | • Nardi: Mycorrhizae and Nutrients pp. 11-22  
• Smith - mycorrhizae Intro  
• Smith - mycorrhizae Chapter 16                                                              | Lab 3: Alton Baker Tree Walk – dress to be outdoors, bring Manual of Oregon Trees and Shrubs |
|    | 10/14 | 6) Demography & Population Dynamics         | • Thomas Ch 5 – Towards the next generation  
• Thomas Ch 8 – New trees from old                                                            | Homework #1 due Oct 12                                                               |
| 4  | 10/19 | 7) Forest Genetics                          | • Forest Genetics – Chapter 1  
• Friedman Forest Genetics for Ecosystem Management                                        | Lab 4: Leaf and Stem Anatomy                                                         |
|    | 10/21 | First Midterm Exam (1-7)                    |                                                                                             |                                                                                 |
| 5  | 10/26 | 8) Forest Pests & Diseases                 | • Schowalter et al. Integrating Ecological Roles of Insects, Pathogens, and Mycorrhizae  
• Betlejewski, Nelson, Shaw (use as reference material)  
• Insects: Wickman, Fellin, Amman (use as reference material)                                | Lab 5: Wood Anatomy                                                                  |
|    | 10/28 | 9) Community ecology; patterns & mechanisms of species diversity | • T.B.D.                                                                                      | Homework #2 due Oct 26                                                              |
| 6  | 11/2  | 10) Understory processes and diversity      | • T.B.D.                                                                                    | Lab 6: Microorganisms                                                               |
|    | 11/4  | 11) Nutrient Cycling in Forests and importance of Nitrogen | • Barron Predatory Fungi  
• Lovett: Insect Defoliation and Nitrogen                                                        |                                                                                 |
| 7  | 11/9  | 12) Decomposition and Soil Organisms        | • Moldenke: Soil Arthropods  
• Nardi: Organisms; 22-36;  
• Nardi 47-67 (Microbes);  
• Nardi Composting 251-256                                                                  | Lab 7: Soil Fauna                                                                   |
|    | 11/11 | Veteran’s Day – no class                    |                                                                                             |                                                                                 |
| 8  | 11/16 | 13) Biomass, Productivity & Carbon Cycling  | OPTIONAL:  
• Lehmann and Kleber Contentious Soil Carbon  
• Ryan et al Forests and Carbon for US Forests                                               | Lab Set #3 due 5/21                                                                  |
|    | 11/18 | Second Midterm Exam (8-13)                  |                                                                                             |                                                                                 |
| 9  | 11/23 | 14) 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 Exam in lab, Nov 23                                                             |
|    | 11/25 | Thanksgiving – no class                     |                                                                                             |                                                                                 |
| 10 | 11/30 | 15) Landscape Ecology & Management          | • Rapp: SU 3, Dynamic Landscape Management  
• Cissel Landscape Management using fire regimes  
• Cornwall Against the Grain (Jerry Franklin)                                                |                                                                             |
|    | 12/2  | 16) Synthesis                              | • Spies et al. Conserving Old Growth in a New World  
• Moore Spiritual Value of Old Growth Forests                                                  |                                                                                 |
| 11 | 12/7  | Final Exam (Cumulative) 8:00 Tuesday, December 7. in classroom (?) |                                                                                             |                                                                                 |

**Red = exam or assignment; Green = outdoor activity**
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**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percent of total</th>
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<tbody>
<tr>
<td>midterm exams (two @ 16% each)</td>
<td>32%</td>
</tr>
<tr>
<td>final exam</td>
<td>20%</td>
</tr>
<tr>
<td>lab exam</td>
<td>20%</td>
</tr>
<tr>
<td>homework</td>
<td>18%</td>
</tr>
<tr>
<td>lab participation</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
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**Lab Activities**

Labs 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. On the lab days when we are scheduled for a walk, please dress for field conditions: it is usually a good idea to bring several layers of clothes in case it is cold or warm. If it has rained in the past day or so be prepared for damp vegetation; rain coats, rain pants, and rubber boots are a good idea if it is really wet. Bring water and any food you might want.

**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 don’t 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.

**Ideas for how to do well in this course**

- Attend all class functions (lectures, labs), 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.

Course Policies

COVID Prevention & Containment

Prevention:
• Wear your mask and make sure it fits you well
• Stay home if you’re sick
• Get to know your neighbors in class, and let them know if you test positive
• Get tested regularly
• Watch for signs and symptoms with the daily symptom self-check
• Wash your hands frequently or use hand sanitizer

Containment: If a student in class tests positive for COVID-19, everyone should:
• Expect and follow guidance in classroom notification
• Answer the call if contacted by the Corona Corps (541-356-2292)
• Isolate if you test positive or are symptomatic
• Quarantine if you are a close contact
• Test weekly if you are unvaccinated or partially vaccinated
• Stay home if symptomatic and complete the UO COVID-19 case and contact reporting form if you test
positive or are a close contact of someone who tests positive.

Support: The following resources are available to students.
• University Health Services or call (541) 346-2770
• University Counseling Center or call (541) 346-3277 or (541) 346-3227 (after hrs.)
• MAP Covid-19 Testing
• Corona Corps or call (541) 346-2292
• Academic Advising or call (541) 346-3211
• Dean of Students or call (541)-346-3216

Communications

Office Hours:
I will host office hours in whatever way I can this quarter, depending on COVID circumstances, to be
determined in the first week of classes. I will also establish a running discussion forum on our Canvas called
“Class Questions and Answers” for the entire group to ask and answer questions as they come up. I welcome
meetings outside my regular office hours, too, knowing that there is considerable uncertainty in all of our lives
right now. Just email me to set a time. If you contact me with a question, I will try to respond within one
business day. I typically provide feedback on assignments within one week.

Why should you reach out to me?
I enjoy talking with students about the course materials and related topics, so please contact me if you’re
confused or just excited about discussing something. I’m also happy to talk about how (or whether) what
we’re learning relates to current events, career choices, or other classes you can take UO. Beyond these
course-related topics, please get in touch with me if you are having a hard time with the class or other
aspects of your academic career. I understand these are difficult times for many of us, in many different ways,
so I would be happy to listen and/or strategize with you to find solutions. I will do everything I can to help you
succeed. If there are deeper challenges that would benefit from professional help, please see below (“Your
well-being”) for some ideas regarding available support on campus.
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 conduct.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.

My guiding principle for conduct within this course is mutual respect. Our classroom should be a place where each of us is treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. Classroom courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student’s legal name, but I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter (or before) so that I may address you properly.

I encourage students with disabilities, including "invisible" disabilities like chronic diseases, learning disabilities, and psychiatric disabilities to discuss with me as soon as possible what appropriate accommodations might be helpful. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

This continues to be a hard time for people in many different ways. The pandemic can exacerbate existing challenges associated with college life and life in general. If any aspects of your life are not going well, there are UO resources that could help. I would encourage you to pursue the following resources if they would be helpful or get in touch with me directly if it would help to discuss any extenuating circumstances. Getting help is a courageous thing to do—for yourself and those you care about.

University Health Services help students cope with difficult emotions and life stressors. If you need general resources on coping with stress or want to talk with another student who has been in the same place as you, visit the Duck Nest (located in the EMU on the ground floor) and get help from one of the specially trained Peer Wellness Advocates.

University Counseling Services (UCS) has a team of dedicated staff members to support you with your concerns, many of whom can provide identity-based support. All clinical services are free and confidential. Find out more at counseling.uoregon.edu or by calling 541-346-3227 (anytime UCS is closed, the After-Hours Support and Crisis Line is available by calling this same number).

Basic Needs. Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course is urged to contact the Dean of Students Office (346-3216, 164 Oregon Hall) for support. The UO Basic Needs Resource Guide includes resources for food, housing, healthcare, childcare, transportation, technology, finances, and legal support.
Assigned reading


Use the following 6 references as help with lecture material. Don’t sweat the details that aren’t stressed in lecture.


Several readings are chapters from *Old Growth in a New World, A Pacific Northwest Icon Reexamined*. 2009. Island Press

ebooks available online via UO library

**Author:** Nardi; title: *Life in the Soil : A Guide for Naturalists and Gardeners*

**Author:** Thomas; title: *Trees: their natural history*

**Author:** Bailey; title: *Silviculture and Ecology of Western U.S. Forests*